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SECTION OF RADIOLOGY AND PHYSIOTHERAPY

WEDNESDAY MORNING, JUNE 6, 1928

THE Section of Radiology and Physiotherapy of the Massachusetts Medical Society, held in the Main Hall of the Chamber of Commerce Building, Worcester, Massachusetts, convened at nine-fifteen o'clock, Dr. Frederick W. O'Brien, the Chairman, presiding.

CHAIRMAN O'BRIEN: The first paper on the program is by Dr. Max Cutler of Memorial Hospital, New York, on the "Relation Between Structure and Prognosis in Cervical Carcinoma under Radiation Treatment." Dr. Cutler!

RELATION BETWEEN STRUCTURE AND PROGNOSIS* IN CERVICAL CARCINOMA UNDER RADIATION TREATMENT†

BY MAX CUTLER, M.D.‡

IT was the purpose of this study to determine the relative value of histologic structure in the prognosis of carcinoma of the cervix treated by radiation and to ascertain the extent to which the cell type may serve as a guide in treatment. The relationship between the structure of tumors and their degree of malignancy has long been recognized but it remained for Broders to demonstrate this graphically by a comparison of the histologic structure with the end result in a large series of cases and for Martzloff to establish a similar relationship in carcinoma of the cervix. A striking feature of these studies has been the very low percentage of cures in the highly cellular tumors even when the disease was in its earliest stages. When one considers the marked radiosensitivity of these cellular tumors the question at once arises whether the most cellular and malignant tumors which comprise this unfavorable group may not be the most favorable for radiation treatment.

It is well known that rapidly growing, highly malignant tumors respond rapidly to radiation. It is equally well recognized that such tumors recur as promptly as they regress. What is the explanation for this curious phenomenon? Clinical and histological evidence clearly shows that extensive destruction of radiosensitive tumors may be accomplished by relatively small doses of radiation but unless complete sterilization of the tumor is effected the viable remnant of tumor is the element of recurrence. It would seem logical therefore to suppose that if the gross anatomic distribution of the tumor is such that uniform radiation, in sufficient quantity, can be delivered, complete eradication of a radiosensitive tumor could be accomplished even when the disease is in its advanced stage. In order to establish this important point definitely it is necessary to present evidence based upon the study of an extensive series of cases observed over a long period, uniformly treated and controlled histologically.

In this study these criteria have been fulfilled. The material‖ at our disposal consists of two hundred cases of unmistakable carcinoma of the cervix treated in 1922 and 1923 whose present condition is known and from whom satisfactory tissue is available for microscopic study. Special emphasis is placed upon the fact that all the cases have been treated by radiation alone, the technique of which, with few exceptions, has been fairly uniform as to type and amount.

Upon analysis of this material it was observed that a number of cases in which the disease was distinctly advanced were well and free of disease for five years. An investigation of the histologic structure in these cases soon revealed that the tumor often presented a highly cellular structure (Grade 3). Pursuing this observation still further the cases were divided into three clinical groups based upon the gross extent of the disease at the time that treatment was begun. This division is most important in order to compare the histologic structure with the result only in cases in which the stage of the disease is controlled.

The basis of histological classification which

*A complete report of this study may be found in the Amer. Jour. Obstet. and Gynec., Vol. XVI, No. 1, p. 15, July, 1928.

†From the Memorial Hospital and Cornell University Medical School.

‡For record and address of author see "This Week's Issue," page 566.

‖The material upon which this study is based is taken from the service of Dr. Wm. P. Healy of the Memorial Hospital.

was adopted is the degree of anaplasia of the tumor. The histologic signs of anaplasia are cellularity, variation in size and shape of nuclei, nuclear hyperchromatism, infiltrative tendencies, loss of polarity and absence of adult differentiated characters. Based upon these features the cases were divided into three groups. At one extreme there is a small group (17 per cent.) in which the tumor cells are highly differentiated, adult in character with definite squamous tendencies (Adult Type—Grade 1). At the other extreme there is a small group (21 per cent.) in which the tumor is highly cellular and anaplastic with complete loss of differentiation, diffuse infiltrative growth of small cells and numerous atypical mitoses. (Anaplastic Type Grade 3). Between these two extremes there is a larger intermediate group (62 per cent.) showing only partial differentiation and moderate anaplasia. This type commonly shows a plexiform arrangement. (Plexiform Type—Grade 2.) The following table is designed to show the relation between the histologic type and the result taking into consideration the stage of the disease.

TABLE I

SHOWING PERCENTAGE OF CURES IN RELATION TO THE CLINICAL STAGE OF THE DISEASE AND THE HISTOLOGIC TYPE UNDER RADIATION AND SURGICAL TREATMENT, RESPECTIVELY

		Radiation			*Surgery*	
Cell Type	Stage of Disease	Total No. cases	No. well	Per cent. cured	Per cent. of operative cures—J. H. H., Martzloff	Per cent. of operative cures—Mayo Clinic, Broders
Adult (Grade I)	Early and Borderline	10	5	50%	47%	53%
	Advanced	25	1	4%		
Plexiform (Grade II)	Early and Borderline	21	9	43%	24%	21%
	Advanced	102	15	14%		
Anaplastic (Grade III)	Early and Borderline	9	6	66%	9½%	9½%
	Advanced	33	14	42%		

It is at once evident that the stage of the disease alone is a most important factor in prognosis. The cures effected in the early and borderline cases are comparatively high regardless of the cell type. The early and borderline cases have been grouped together in order to isolate the distinctly advanced cases as a test group. *The crucial test of the relative importance of the histologic type is to control the stage of the disease by studying prognosis in a group of advanced cases in which an unfavorable outcome is expected.* It is quite evident from this table that the prognosis in advanced cancer of the cervix under radiation therapy is extremely poor in the adult type and unexpectedly favorable in the anaplastic group.

It is of considerable interest to analyze briefly the factors which render this disease especially amenable to radiation treatment.

(a.) With rare exceptions, cancer of the cervix remains localized for long periods without producing distant metastasis. Even when the disease has become advanced and invaded the parametrium the process is still local and not disseminated. In this respect cancer of the cervix differs from other tumors of a similar grade of potential malignancy. Cellular epidermoid carcinomas of the tonsil, nasopharynx, larynx and esophagus (Transitional Cell Carcinoma) whose histologic structure closely simulates the plexiform and anaplastic types of carcinoma of the cervix metastasize early and disseminate widely while the primary lesion is still in its early stages. This peculiar tendency of the disease to remain localized and confined to the parametrium undoubtedly accounts for the ability to cure the disease under certain conditions even in its advanced stages.

(b.) The anatomical conditions for radiation treatment are peculiarly favorable in cancer of the cervix. The lesion may be radiated from within the cervical canal, through the vagina, by direct implantation into the tumor and the parametrium may be radiated externally. Thus there are four means of attack from different sources each of which may be centered directly upon the lesion.

(c.) The most important reason for the successful results in the radiation treatment of carcinoma of the cervix is to be found in the histologic structure. When it is considered that from 60 to 80 per cent. of carcinomas of the cervix are radiosensitive it is obvious that this factor must play a most important rôle in the favorable results of the radiation treatment of this disease.

The advent of radiation as a therapeutic agent in the treatment of cervical carcinoma lends a special significance to histologic prognosis. It should be emphasized that in a study of relation between structure and prognosis the therapeutic agent employed is a factor of prime importance. The varying degrees of malignancy described by Broders and later by Martzloff are based upon studies in which surgery was the treatment employed. These results state essentially that the prognosis is best in the most dif-

ferentiated and adult tumors and worst in the very cellular, undifferentiated and anaplastic tumors. When radiation is used instead of surgery we find that this relationship is completely altered by the fact that the more cellular and undifferentiated tumors are the more radiosensitive and consequently offer a better prognosis.

The close relationship between clinical course, susceptibility to radiation and histologic structure found in this study coincides with a similar parallel relationship observed in tumors in other locations. A distinct clinical, pathological and radiological entity is encountered in so-called transitional cell carcinoma of the base of the tongue, tonsil and nasopharynx. The essential feature of this disease is the radiosensitivity of a group of anaplastic epithelial tumors found in these particular anatomical regions. Operative removal of the primary lesion or metastatic nodes results invariably in local recurrence and wide dissemination of the disease, whereas their response to radiation is phenomenal. An analogous situation is found in the operative removal of a highly cellular anaplastic carcinoma of the cervix. When rapid local recurrence and distant metastasis follow hysterectomy the cell type is usually of the anaplastic variety (Grade III), and consequently is especially amenable to radiation.

Although the results of surgery in the treatment of malignant disease are dependent upon numerous factors, it is a well recognized fact that the degree of malignancy of the tumor is one of the most important determining factors. The best results are obtained in the most adult and differentiated type, whereas the worst results occur in the surgical treatment of the very malignant cellular tumors.

Since the advent of radiation the problem of histologic prognosis has become somewhat confused. This confusion is due largely to the failure to recognize the fundamental biological law, that the most cellular and most malignant tumors are at the same time the most radiosensitive. This brings about an apparently paradoxical situation in which the most malignant tumors should offer the best prognosis when radiation is employed. In view of the fact that the most malignant tumors offer the worst prognosis with surgery and the best with radiation, a comparison of two series of cases in which the therapeutic agents have not been considered is misleading. Another matter of confusion has been the use of the term "malignancy" in relation to radiation. Because of their radiosensitivity, the question has been raised as to whether the cellular and anaplastic tumors are therefore not less malignant. If this attitude is adopted, the degree of malignancy of the tumor must vary according to the therapeutic agent employed. It seems more sound to regard the degree of malignancy of a tumor as an intrinsic biological property and independent of external influences. Surgery and radiation are external agents and may influence the clinical course of the disease and alter the prognosis, but the degree of malignancy as a potential factor remains unchanged. It might be well to adopt Ewing's distinction between potential malignancy and clinical malignancy. From this viewpoint the former is a constant factor, whereas the latter varies and depends upon the therapeutic method employed.

The results of this study indicate a direct relation between the degree of radiosensitivity and the percentage of cures. The results coincide with the theoretical principle involved. The low degree of malignancy of the adult and highly differentiated type of tumor is accompanied by a good prognosis only when the disease is in its early stage. These cures are effected by the caustic action of a large dose of radiation on an early lesion, so that the limited disease is eradicated in spite of its radioresistance. Where, however, this type of growth becomes more advanced and involves the parametrium, its prognosis becomes grave because we have to combat, not only an advanced lesion, but also a radio-resistant lesion (See Table I—4% "cures").

Examination of the anaplastic group (Grade III) shows a distinctly higher percentage of cures than in the other two groups. The remarkable feature is the high percentage of cures in the advanced cases (42%). This result is attributed to the marked radiosensitivity of the anaplastic type of growth. It would seem, therefore, that the high potential malignancy and advanced stage of the disease are both offset by their marked susceptibility to radiation resulting in a cure in a high percentage of cases. In the intermediate group the tumor is neither highly malignant nor particularly radiosensitive. The lower percentage of cures in this group may be readily explained by the high proportion of advanced cases (83%).

The observations recorded here find support in the studies of other investigators. Thus Martzloff quotes fifteen advanced cases of carcinoma of the cervix in whom the prognosis seemed very poor clinically, but the patients lived for a long time, some under radium treatment. Ten of these cases belonged to the histologically malignant group, consequently they were susceptible to radiation. Plaut finds four cures among nine cases of spindle cell carcinoma treated by radiation and points out the good prognosis in the most malignant cell type as evidence against the value of histologic prognosis. It is important, hoyever, to recognize that the poor results obtained by Martzloff in this group and the good results of Plaut may be readily explained by the fact that surgery was the therapeutic agent employed in the former group and radiation in the latter. These are precisely the results to be expected in the treatment of the most malignant type of tumor by surgery and radiation, respectively.

Apparently the same property of instability

of the tumor process which renders a tumor more malignant and causes it to grow rapidly and disseminate widely also renders it more susceptible to radiation. The rapidly growing tumors as a rule respond rapidly to radiation and vice versa. Consequently the prognosis must depend upon the biological response of the tumor to the particular therapeutic agent employed.

From a practical standpoint it is of some importance to be able to predict by histologic study what response to radiation may be expected in any given case. The ability to recognize histologically a group of carcinomata of the cervix which are especially unsuitable for surgery and peculiarly amenable to radiation may help to eliminate many of the unfavorable surgical results and decidedly improve the percentage of surgical cures where this method is still employed. In the advanced cases this information may serve as a useful guide to radiation therapy.

SUMMARY AND CONCLUSIONS

1. The degree of potential malignancy of a given case of carcinoma of the cervix may be determined with reasonable accuracy by a study of the histologic structure. This information may be of considerable value in prognosis and treatment.

2. Epidermoid carcinoma of the cervix may be classified histologically into three grades, based primarily upon the degree of anaplasia. These groups correspond closely to three degrees of potential malignancy as well as to three grades of radiosensitivity (low, medium and high).

3. The adult type of carcinoma of the cervix (Grade I) is markedly resistant to radiation; the anaplastic type (Grade III) is highly radiosensitive; whereas the plexiform type (Grade II) occupies an intermediate position.

4. The factors which determine prognosis in carcinoma of the cervix, as in other diseases, are multiple and not single. The clinical stage of the disease at which treatment is instituted and the radiosensitivity of the tumor are believed to be the most important factors in prognosis when radiation is employed.

5. Twenty-five per cent. of carcinomas of the cervix are histologically very cellular, malignant and anaplastic tumors and consequently are highly susceptible to radiation.

6. Under radiation treatment the prognosis of cancer of the cervix improves with the degree of anaplasia of the tumor. This is due to the greater radiosensitivity of the more anaplastic tumors and results in a high percentage of cures in a group in which the surgical results have been especially unfavorable.

7. Radiation therapy of advanced uterine cancer may result in a cure in a relatively high proportion of cases when the tumor is of the radiosensitive type, whereas in the radioresistant type the prognosis is distinctly worse and only a palliative result can be expected.

8. The results of this study confirm the biological relationship between anaplasia and radiosensitivity and demonstrate the ability to cure advanced disease of the most malignant type by radiation in a high proportion of cases.

CHAIRMAN O'BRIEN: The discussion of Dr. Cutler's paper will be opened by Dr. George A. Leland of the Huntington Hospital.

DR. GEORGE A. LELAND: *Mr. Chairman and Members of the Section:* I think we are very fortunate to have been present this morning to hear this fine presentation. Dr. Cutler is to be congratulated on his very clear discussion of this complicated subject.

Any factor or point which aids in the more accurate prognosis of a case of cancer is not to be underestimated. It would seem that cancer patients and their friends and relatives are becoming more and more inquisitive as to what the outcome of treatment is going to be. This is particularly so, I think, where radiation is used in contradistinction to operation.

This paper has brought forward several new points with regard to the prognosis, with particular reference to the radiosensitivity of carcinoma of the cervix. At the Huntington Hospital, we have had under rather intensive study a similar group of cases.

These cases numbered 497. They were all primary carcinomata of the cervix. They were all treated with radium. In the first place they were studied from the anatomical point of view as regards the extent of the disease. The classification was that which is recommended by the American College of Surgeons for carcinoma of the cervix. There are four groups. The "A" Group are those cases in which the disease is limited to the cervix; the "B" Group is those where the disease has gone into the uterine cavity or onto the vaginal walls; the "C" Group is those where there is beginning involvement of the broad ligaments, and the "D" Group is those with the wide fixation in the pelvis or those with remote metastases. There were 7 cases in "A," 55 in "B," 218 in "C," and 217 in "D." Combining the "A" and "B" Groups together and calling them a favorable group for treatment, we found that there were 62 cases or exactly 12.5 per cent. of the total that come under this favorable classification. In other words, only 1 in 8 patients reported to the hospital in what we may call the favorable group.

Looking at these cases from the point of view of effectiveness of radium, in those that were well after radium treatment for 3 years we found 5 out of 7 in Group "A," 19 out of 55 in Group "B," 10 out of 218 in Group "C" and 2 out of 217 in the "D" Group.

Reducing those columns to percentages of the groups, we find the figures very much like those

that Dr. Cutler has told us about. Of the "A" Group 71 per cent. were free from the disease for 3 years; of the "B" Group 34 per cent.; of the "C" Group 4 per cent.; of the "D" Group 1 per cent. Combining the "A" and "B" Groups, we find that there are 38 per cent. cured.

We have studied these cases with reference to the duration of symptoms between the time that the patient first noted the symptoms and the actual treatment, and we found in the "A" Group there was a difference between the first symptoms and radium treatment of approximately 3½ months; in the second group 5½ months; in the third group 7½ months, and over 10 months in the final group. There was approximately a difference of two months between "A" and "B," and "B" and "C." When we came to draw a curve we found that it practically worked out that a delay of one month in these cases lessened the patient's chance of getting into the cured class by about 16 per cent.

Now with reference to the relationship of the histologic pathological distribution of these cases, when we came to analyze them pathologically we had 235 cases. This study, from the pathological point of view, was made entirely by the late Dr. J. Homer Wright, who had not quite completed the study at the time of his untimely death. We have divided these cases into these four clinical groups and into Dr. Wright's classification which is similar to Dr. Cutler's. Dr. Wright called them the high, low and medium malignancies, the adenocarcinomas and those in which there was a combination of adenocarcinoma and squamous cell (adenoäcanthoma). This grouping showed the percentages to be as follows: 62+% high malignancy, 23+% medium malignancy, 7+% low malignancy and others 6+%.

When we came to apply these pathological groupings to the actual three year cures we did not find that the percentage of cures corresponded to the degree of malignancy. There were 146 cases of high malignancy with 13 cures (8.9%); 56 cases of medium malignancy with 8 cures (14.1%); 17 cases of low malignancy with 1 cure (5.8%); no cures in 13 cases of adenocarcinoma or in 3 cases of adenoäcanthoma. That would seem to bear out the same contention that Dr. Cutler has made, namely, that histologically perhaps the lower malignancies may appear, the less sensitive they are to radium and hence the cures are not obtained.

When we came to group these cases, however, from the point of view of the favorable "A" and "B" Groups, we found that of the three grades of malignancy the actual percentages were approximately the same. (56% for the high, 55% for the medium and 50% for the low malignancies.) This likewise bears out Dr. Cutler's contention that in the favorable groups it does not make much difference in which grade of malignancy a given case falls. Our conclusions are that in so far as carcinoma of the cervix is concerned the extent and duration of the disease is of greater significance in determining prognosis than the microscopic evidence of degree of malignancy.

(Applause.)

CHAIRMAN O'BRIEN: If it is the sentiment of the Section, we will defer general discussion of the papers until the end of the meeting, contingent upon the time we may have then.

The second paper is by Dr. Byron Sprague Price of New York City, "Physical Therapeutics in Pneumonia."*

CHAIRMAN O'BRIEN: The next paper on the program is "Practical Points from Pyelography," by Dr. Douglas J. Roberts of Hartford, Connecticut.

*The paper by Dr. Byron Sprague Price is not ready for publication. If submitted later it will be published with discussions.

PRACTICAL POINTS FROM PYELOGRAPHY†

BY DOUGLAS J. ROBERTS, M.D.‡

INASMUCH as clinical rather than technical points are the present consideration, my purpose is to give briefly the important findings one should look for when examining the upper urinary tract in conjunction with a cystoscopist. The normal anatomy of the tract will not be discussed, aside from saying that the variations in the arrangement and shape of the kidney, calices and pelves are legion. However, when both the right and left sides are examined, a certain degree of similarity may be expected—this forms a basis upon which to draw conclusions regarding a departure from the normal.

Our routine procedure is to make a preliminary stereoscopic examination of the entire tract on 14 x 17 films, with the catheters in situ. Then both kidneys are injected, unless fever, marked weakness, or advanced pathological changes are known to exist in each kidney. A 14 x 17 film is exposed, leaving the catheters in place. Then, injecting the while, the catheters are completely withdrawn, thus filling both ureters, and partially or completely filling the bladder, after which another film is made to stereoscope with the former.

From the preliminary stereo set, information may be derived of the empty tract, chiefly con-

†Read before the Annual Meeting of the Massachusetts Medical Society, Worcester, Massachusetts, June 6, 1928.

‡For record and address of author see "This Week's Issue," page 566.

cerning calculi and if these are in the ureters, the proximity to the opaque catheters may be shown.

The second set gives the balance and major portion of the evidence and, if calculi are present, it indicates whether or not they are included in the filling. Abnormal fillings of the calices or pelves, or both, when marked, are usually fairly simple in their interpretation, providing a complete injection has been made; however, if the filling is only partial, it may be a source of considerable and serious error.

The anomalies encountered in the upper urinary tract are of particular importance. The type of kidney pelvis varies from the small congenital and atrophic forms to the large variety with many calices.

The calices show the utmost variation in arrangement, but normally should present a cupped, or flat, periphery.

Multiple pelves, calices and kidneys also are encountered almost daily, and are of themselves of no clinical importance, once they are recognized as such. This may be likewise said of the rarer fused and misplaced kidneys.

A floating kidney may be differentiated from a misplaced kidney by films made in both upright and horizontal positions.

Of urinary calculi it is stated that 96% should be shown. A small part of this group, the non-opaque stones—those lacking in calcium—are evident as translucent areas in the opaque fillings and are usually found in the pelvis where they may be round, or may conform to the shape of the pelvis so that their differentiation from a blood clot or tumor is sometimes difficult.

An early stage of hydronephrosis may be suspected when the minor calices are obliterated, or the calices and pelves are partially dilated. The degree of hydronephrosis is no criterion of the amount of obstruction present. Usually, the longer the duration of the obstruction—whether partial or intermittent—the more marked the dilatation above. Ordinarily, obstruction at the lower end of the ureter causes dilatation of the major and minor calices, with comparatively limited dilatation of the pelvis, whereas obstruction at the upper portion of the ureter more frequently results in predominating dilatation of the true pelvis.

When hydronephrosis results from mechanical obstruction, without infection, the contour of the pelvis and calices is enlarged but smooth in outline, while if infection is present, or is the causative factor, the border is frequently irregular.

The usual causes of hydronephrosis are:

First—Calculi: renal, ureteral and urethral.
Second—Ureteral obstructions other than from calculi, such as stricture, tumors or compression changes from without such as may happen in pregnancy or extra-ureteral tumors, glands, etc.
Third—Urethral obstructions, which are most frequently caused by pressure from an enlarged prostate.
Fourth—Movable kidney with kinking or torsion of the ureter, often by an aberrant blood vessel, or an abnormal renal artery.
Fifth—Bladder changes resulting from central nervous system diseases, such as tabes.

In general, as Braasch has said, "Too often we see the end result when the kidney can no longer be saved, which should make us the more careful of earlier diagnosis upon minor findings accompanied by symptoms".

In pyelonephritis, often no changes are demonstrable in the early stages, or there may be slight enlargement of the pelvis and beginning clubbing of the calices. Later, as scarring and fibrosis take place, the pelvis is apt to become contracted or irregular, and more marked enlargement of the calices may result.

In pyonephrosis, areas of necrosis are evident as abscess cavities in the renal parenchyma. The kidney is usually enlarged and the pelvis and calices dilated or distorted by connective tissue changes. The ureter often shows areas of both dilatation and constriction.

A specific form of pyonephrosis is renal tuberculosis, which seldom manifests a distinguishing characteristic in the pyelogram. Meyer states that only 20% of tuberculous kidneys show calcific deposits. Braasch and most of the foreign writers do not countenance routine pyelography as the method of diagnosis of renal tuberculosis, claiming that it is usually unnecessary when the proper clinical methods have been carried out. They likewise stress the possible hazard of disseminating the organism into the renal venous channels, if excessive pressure is used in filling the kidney.

Pyelographic evidence of renal tuberculosis is suggested by any one or a combination of the following points:

First—Areas of cortical necrosis, often confined to a single region.
Second—Irregular dilatation of the pelvis.
Third—Obliteration of one or more calices, or moth-eaten appearing calices—the so-called "ostrich plume" or "cauliflower" deformity.
Fourth—Stricture of the ureter.

Tumors of the kidney are cortical, or pelvic in origin. Cortical tumors produce compression, distortion, or elongation of the calices or pelvis. As this form of tumor grows, it either carries the calyx along and narrows it, or obliterates the filling in a whole section of the kidney. Tumors originating in the pelvis are ordinarily readily shown in their early stages by filling defects. However, papillary tumors, which are usually located in the pelvis, may be confused with non-opaque calculi and blood clots. Always be sus

picious of a case of hydronephrosis with bleeding. If a blood clot be suspected, re-ëxamine after bleeding has stopped. In hematuria, 50% of the lesions are primary in the upper urinary tract, and 75% of renal tumors will present gross bleeding. Lower polar and pelvic tumors are prone to displace the upper ureter. A sharply defined, enlarged, or irregularly shaped kidney points to tumor, whereas a poorly outlined kidney structure is more indicative of an inflammatory process.

The polycystic kidney is usually bilateral and quite characteristic in appearance, with the numerous cystic areas encroaching on the pelvis and calices, causing considerable and somewhat symmetrical alterations in their contours. The solitary cyst is more rare, and encroaches on the terminal calices. Unlike the cortical tumor it is more prone to shorten the adjacent calices.

To summarize best is to enumerate the most likely sources of error—

First—Lack of knowledge of the normal variations of the pelves and calices.

Second—Attempting to draw conclusions from unsatisfactory examinations both as regards the quality of negatives and incomplete fillings. If doubt exists always encourage a confirmatory re-ëxamination, and if none can be obtained be conservative in the evaluation of the findings.

Third—Lack of complete understanding between urologist and Roentgenologist. Each is certainly dependent on the other for the best results.

CHAIRMAN O'BRIEN: The discussion of Dr. Roberts's paper will be opened by Dr. Bernard Spillane of Hartford.

DISCUSSION

DR. BERNARD SPILLANE, Hartford: It has been a real pleasure to come up here today and say a few words. I won't attempt to discuss Dr. Roberts's paper from the roentgenologist's standpoint but I think there are a few things from the cystoscopic viewpoint that may be of interest.

First of all, I am strongly in favor of the closest co-öperation between the x-ray man and the cystoscopist. We are fortunate at the Hartford Hospital in having our Cystoscopic Department adjacent to that of the x-ray and we have always at our beck and call a first-class technician.

As to the use of filling solutions, I have been through the different mediums from thorium on, and the men who preceded me of course used all the colloidal silvers but we believe that the 12 per cent. sodium iodid solution combined with the 1 to 3000 mercuric iodid which Graves and Cunningham brought out a few years ago, is the ideal one. The sodium iodid is non-toxic, non-irritating and about the same viscosity as distilled water.

Dr. Roberts spoke about the question of fillings in tuberculosis of the urinary tract. Personally, I think that urography is one of the very finest means we have of diagnosing tuberculosis of the urinary tract, and, as I was saying this morning coming up, the only case that I know where perhaps the filling caused a lighting up of a chronic tuberculosis was this case he showed you here of the marked sacculation or diverticulum of that ureter.

I think with the urogram that we are able to determine not only the presence of urinary tuberculosis, which of course we can determine by other cystoscopic measures, but we can also determine the extent of the lesion.

From a surgical standpoint, removal of the kidney in itself does not always cure these patients. I think a splendid example of that is this case of tuberculous abscess involving an area about the size of the thumb-nail in the kidney, but if you noticed the ureter, it had the typcial moth-eaten appearance. We do not hesitate to go along and do a complete nephroureterectomy, whether in one or two stages, and, in the last couple that we have done, it may be hard to believe, but we have had primary union in both the oblique and the supra-pubic wounds.

Another thing is the simultaneous bilateral fillings. We have done over 5000 of these cases and we don't hesitate to use the double fillings at one time. We can truthfully say that we have never had any accidents following it. I am certain that the accidents following bilateral pyelography are probably due to some error in technique.

We are fortunate also in having close co-öperation from the pediatrician and are running quite a series of children. We can cystoscope these youngsters just as well as adults, and we find almost the same pathological conditions present as in the older people.

I thank you. (Applause.)

DR. MERRILL C. SOSMAN, Boston: *Mr. Chairman, Ladies and Gentlemen*—It is fairly well established, I think, that with the modern apparatus and technique we can make over 90 per cent. accurate diagnoses in urological cases; in fact, Waters of Baltimore just recently told me that they go as high as 97 per cent. in Young's Clinic. That is more than we can claim.

The interpretation and the technique are both well established. Our advance, our progress will probably be made from closer scrutiny, closer attention to the minor details of these two—technique and interpretation.

There is one thing in the technique, I think, which is not yet perfect and that is a pyelographic medium. The sodium iodide and mercuric iodide of Graves and Quinby are probably the best we have at the present time but they do give a certain number of reactions and they are certainly uncomfortable. We want to have a medium which will have the same consistency as the urine and give no reaction at all, and a medium at the same time which is quite opaque

and cheap and easily sterilized. Those points are all very important.

Progress in the interpretation will probably be made by paying more attention to the unusual cases and the mistakes, perhaps, as Dr. Roberts emphasized.

In the unusual cases I might ask Dr. Roberts if he could tell me how he makes the diagnosis of a streptothrix infection of the kidney. I certainly would like to learn that point.

In these unusual cases, there are certain numbers which occur with fair frequency and of which the larger clinics see perhaps two, three or four a year. I have taken the liberty of bringing some slides with me, showing two of these types of cases.

(Slide.) The first case is that of a patient who has had vague right upper quadrant symptoms for several years but the thing that brought him to the hospital was a sudden, acute pain followed by fever, chill and leukocytosis. He had all the symptoms of an acute cholelithiasis, including a resistance in the right upper quadrant. He had no jaundice. He was explored and the surgeon found a retroperitoneal mass which was tender and pulsating. The incision was sewed up. He was turned on the side and a lateral incision made, and that mass was found to contain a thin, sanguinous serum and pus.

(Slide.) The cavity was then injected through the flank. You can see the drainage catheter here, showing this tremendous cystic area in the kidney. After he had recovered, a pyelogram was made.

(Slide.) This pyelogram shows the marked flattening of the superior calix which Dr. Roberts has emphasized as being more characteristic of the cysts than of the primary hydronephromas.

(Slide.) We then injected the cystic cavity keeping the pelvis filled, and you see the relation of the two, the large cyst pushing the kidney down and flattening the kidney considerably. This was a cyst arising from the pelvis of the kidney. This cyst became larger and larger, eventually becoming infected and causing this condition.

(Slide.) Here is a patient with severe pain in the flank, that being the only symptom, and we find this peculiar circular shadow looking very much like a gall-stone. It is on the left side, however, and very close to the ureter.

(Slide.) This shows the pyelogram. The patient, unfortunately, moved, but the shadow is just outside of the pelvis and causes a definite depression in the pelvis. We saw some similar cases reported in the *Acta Radiologica*, which were diagnosed and confirmed at operation as aneurysms of the renal artery. They reported three cases. This was the probable diagnosis in our case although the symptoms have not been severe enough to justify operation up to the present time. You have this particular type of annular shadow just outside of the pelvis, the aneurysm of the renal artery causing severe pain and sometimes hemorrhage.

It is a study of these unusual types of lesions which will hasten the progress in urology. (Applause.)

CHAIRMAN O'BRIEN: The next paper is "Osteochondritis Luetica: Comparison With Analogous Zones in Rickets and Infantile Scurvy," by Dr. Ralph S. Bromer of the Children's Hospital in Philadelphia.

OSTEOCHONDRITIS LUETICA: COMPARISON WITH ANALOGOUS ZONES IN RICKETS AND INFANTILE SCURVY*

BY RALPH S. BROMER, M.D.†

OF the diseases of infancy and childhood, rickets, infantile scurvy and congenital syphilis are very frequent. Each of these shows at various stages of the disease pathological skeletal changes which are recognizable on the roentgenogram. The changes in the long bones occur where the two normal processes of ossification take place. These areas are (1) where elongation of the diaphysis, endochondral ossification occurs, and (2) where growth in thickness, endosteal or periosteal ossification occurs. The differential diagnosis does not rest on any characteristic endosteal and periosteal reaction or changes, inasmuch as it is difficult or actually impossible to make a differential diagnosis on this basis alone. The diagnosis is made only by recognition of the pathological processes going on in the endochondral areas of growth. Also the rate of growth in endochondral ossification is much greater than in endosteal and periosteal ossification, and, for instance, rachitic changes reach their greatest manifestation in those portions of the skeleton which grow the fastest. (Schmorl[11]) (Wimberger)[1]. Thus, also in infantile scurvy, the changes at the diaphyseal ends are apparent before the sub-periosteal hemorrhages appear and in congenital syphilis, osteochondritis luetica appears practically always before periostitis luetica. The most rapidly growing bones are the upper ribs, at the costo-chondral junction, the distal ends of the femur and ulna and the proximal end of the humerus. (Wimberger). The endochrondral pathological changes only will be discussed in this article.

The histological section of normal bone

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†For record and address of author, see "This Week's Issue," page 566.

through the long axis of the growing end, going from the epiphysis to the diaphysis shows first the resting cartilage, and then a layer in which the cartilage cells become increasingly larger, the proliferating cartilage. These larger cells are regularly arranged in columns which extend toward the diaphysis and form the so-called layer of columnar cartilage. The long axis of the columns is parallel to the long axis of the shaft. These columns become more hypertrophic. Next follows the zone of temporary or preparatory calcification. It is in the matrix of the layer of the columnar cartilage nearest the bone cartilage junction that the preliminary deposition of calcium takes place. This zone has a sharp line of demarcation and it may be flat, convex or concave. Its very regular arrangement depends upon the cartilage containing blood vessels which run transversely through the columnar columns at right angles to the long axis of the bone (Wimberger). The young bone tissue is deposited upon the calcified matrix in the preparatory zone of calcification. Primary medullary spaces are formed and branching blood vessels break through the dividing walls of the cartilage cells, so that longitudinal islands of the ossified cartilage remain free and isolated in the marrow cavity. On these longitudinal walls, the osteoblasts are deposited, being brought there by the blood vessels from the bone marrow, and so the cartilaginous tissue is transformed into osseous tissue. This is the zone of primary spongiosa, or primary bone formation, and is succeeded by the fully developed bone. The thick ossified trabeculae of the primary spongiosa are soon reconverted, being first absorbed by the osteoclasts and then freshly constructed by osteoblasts. The fully developed bone (secondary spongiosa) consists of strong trabeculae, the intervening spaces being filled with lymphoid marrow.

On the roentgenogram of a normal long bone the shaft widens out toward the end forming the diaphyso-epiphyseal junction. It is this area that is sometimes called the metaphysis. The widened out end of the bone shaft as described by Wimberger, is divided from the non-opaque epiphyseal layer of cartilage by a transverse, thin, homogenous and sharply defined line which corresponds to the histological area where the inorganic salt of calcium and phosphorus are deposited, and includes the preparatory zone of calcification and the primary spongy bone. The ends of the diaphyses of certain bones, the distal end of the ulna, the distal and proximal ends of radius and the fibula, are better suited for roentgenographic study as they are separated from the epiphysis by a flat, or almost flat preparatory zone of calcification. Those with a wavy surface, the proximal and distal ends of the tibia, and the distal end of the femur present more difficulties in recognizing the pathological changes on the roentgenogram. Parallel to the zone of preparatory calcification, on the diaphyseal side, there is a thinner, less dense area having a blurred appearance, which blends on the side toward the marrow cavity into thin, fine, and sharply defined trabeculae. These run for the most part longitudinally, and become coarser and thicker towards the middle of the shaft.

On the roentgenogram of the normal bone, density is determined (Weech and Smith)[2] by the calcified intercellular matrix and the calcified trabeculae. The former casts the more intense shadow, and this is illustrated by the new line which is formed when rickets begins to heal, and is even better illustrated by the broad intense band which occurs in early congenital syphilis. Smith and Weech in their experimental work found that these areas on the roentgenogram when compared with histological sections showed that in each instance, the density was due to the calcified intercellular substance. It is in the preparatory zone of calcification and the zone adjacent to it on the diaphyseal side, that the characteristic pathological changes in osteochondritis luetica, rickets and scurvy occur, which so materially assist in their differential diagnosis. When in addition, the changes in the epiphyseal center of ossification are taken into consideration, the cause of periosteal proliferation as seen on the roentgenogram can usually be determined.

CONGENITAL SYPHILIS

Wegner in 1870[3] described fully the changes occurring in congenital syphilis at the ends of the long bones and called this process an osteochondritis. He recognized and described three stages. The first is characterized on gross pathological examination of a longitudinal section, by a band, 2 millimeters in width, at the site of the normal location of the zone of temporary or preliminary calcification. This has a shining white or whitish red color, has a homogenous texture and is of a somewhat soft and brittle consistency. The normal zone of temporary calcification can only be distinguished with more or less difficulty and if recognized it has a fairly sharp distinct line of demarcation. In the syphilitic bone it has a somewhat wavy uneven appearance, recognizable by its color, whitish red. On microscopical section this zone can be easily identified as the zone of temporary calcification and the increased growth of the proliferating cartilage cells is shown. The process is one of moderately increased proliferation of cartilage cells on the epiphyseal side and retardation of the transition of the calcified cells of the zone of temporary calcification into true bone, (spongiosa).

The second stage shows according to Wegner more striking changes. The zone of temporary calcification becomes widened on the gross specimen to 4 millimeters, and shows on the proliferating cartilage side, slender, or at times thicker, wart-like projections of shiny calcium

infiltrated areas into the mass of the proliferating cartilage. Wegner likens this appearance to the papillary arrangement of the cutis. From the points of these projections, oblique or transverse bands run through the cartilaginous tissues so that the latter appear as isolated or wandering islands of hyaline cartilage. The form of the epiphyseal boundary acquires a torn, irregular and somewhat disordered appearance. The hyaline cartilage shows a bluish color on cut section, and is of gelatinous consistency. On microscopical sections the columnar rows of proliferating cartilage cells are thickly placed with little intercellular substance between them. The cartilage vessels are richly developed, and toward the ossification zone are surrounded by stringy, and thready connective tissue. On the diaphyseal side of the zone of temporary calcification, out of this web of connective tissue and blood vessels, the osteoid bone is formed. Later this forms true bone. At the same time premature sclerosis or calcification of the intercellular substance is going on. The normal process of decalcification is retarded to an even greater extent than in the first stage.

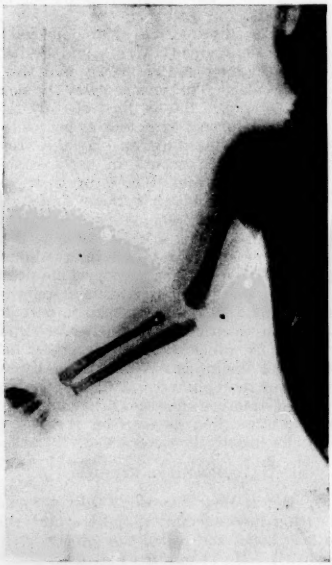

FIG. 1. Illustrates the first stage of osteochondritis. Dense zones of temporary calcification at the distal ends of the radius and ulna are present, with also a mild periostitis luetica of the shafts of the radius and ulna.

The third stage as described by Wegner shows a swelling of the joints and also of the borders of the cartilage of the ribs. They are swollen, the appearance somewhat resembling that of rickets, and the periosteum is thickened especially at the shaft ends near the epiphyses. On longitudinal section, the transition zone between the spongiosa of the diaphysis and the hyaline cartilage of the epiphysis shows a variegated appearance. The last distal layer of the hyaline cartilage appears blue, and is bulging on the cut surface. Then follows a zone, 2 to 4 millimeters wide, bounded by a wavy line due to a layer of a somewhat turbid, grayish yellow to grayish white, homogenous and thick mass. This is hard to the touch, but is in some places brittle and crumbling, so that with the point of the knife, small, light fragments of the loosely joined substance can be picked out. Upon this follows a very irregular, at times broad, at other times thinner, layer of soft, viscous consistency which has a grayish red to a grayish yellow color. This layer gradually blends with the spongiosa of the diaphysis. This soft zone does not have a normal coherence, and crepitations can be obtained by grasping the epiphysis and the diaphysis and pushing one against the other. This, Wegner states, can be obtained on the cadaver as well as on the cut longitudinal sections of isolated bone. Thus the epiphyseal separations of the third stage occur as a result of this weakened zone.

FIG. 2. The second stage of osteochondritis luetica. A rarefied zone is present just behind the dense zone of temporary calcification, at the distal end of the radius.

Microscopically the sections show greater proliferation of the columnar cartilage cells of

the epiphysis and greater calcium infiltration of the cartilage along the course of the vessels with formation of osteoid tissue, than in the second stage. In the zone which macroscopically appears grayish red, or yellowish, with an inflammatory appearance, the histologic appearance varies. Thus in the first case, the red color is caused by richly vascularized granulation tissue, with thickly placed spindle and round cells with a homogenous intercellular substance; in the second case, a mass much resembling granulation tissue is substituted for the marrow of the normal foetal bone, consisting of marrow cells with little connective tissue, and very numerous blood vessels. The granulation tissue carries much fewer blood vessels and shows instead round marrow cells, softer and larger spindle cells.

In the early stage of the disease, the roentgenogram shows a broad dense shadow at the diaphyseal end which on the side toward the epiphysis is usually seen as a fairly well defined line, but if roentgenograms are secured showing exceptionally fine detail, projections, almost tooth like or jagged, can be seen extending down into the non-opaque cartilage of the epiphysis. These are the papillae like projections described by Wegner. On the shaft side, this dense zone has usually a straight boundary, but occasionally it has a slightly wavy appearance. It merges with the more well defined trabecular bone tissue of the shaft. According to Schmidt[4], this broad zone represents not only the zone of temporary calcification but also embraces a zone of the youngest and earliest trabeculae, which are formed from the cartilaginous matrix arranged in a calcium containing, lattice work form. (Kalkgitter). These two zones show as one dense, almost structureless shadow on the roentgenogram. (Fraenkel)[5].

In the second stage the dense zone persists, but the fine projections into the cartilage of the epiphysis become more marked and more easily visible. They can be distinguished more easily on roentgenograms of poorer quality. Gradually as the disease progresses in this stage, a zone of rarefaction appears within the dense zone. This may first be noticed on the side toward the non-opaque epiphyseal cartilage, or it may appear on the other side toward the zone containing the young bone trabeculae. There is no general rule as to its appearance (Fraenkel). As the process advances, this rarefied band becomes larger and may seem to run through the middle of the broad dense band of the first stage, and it represents the replacement of the calcium containing tissue by the granulation tissue previously described. The trabeculae become much thinner and the zone is practically non-opaque to the roentgen rays.

In the third stage, the projections into the epiphysis are very apt to be less fine and may present an uneven, somewhat serrated, not sharply jagged outline. The change into granulation tissue has progressed so that the so-called epiphyseal separations occur. There also may be present, punched out rarefied areas in the terminal borders of the diaphyses. Actual fragmentation of the terminal ends can sometimes be seen. The epiphyseal separations are usually not actual separations at the diaphyso-epiphyseal junction, but are infractions of the diaphysis, the zone of temporary calcification being carried away with the epiphysis. Fraenkel believes that this is usually the case, but he will not state that an actual dislocation or separation never occurs. In none of my cases was an actual separation found.

Apparently, few studies on the method of repair of osteochondritis luetica, as shown on the roentgenogram have been reported, as compared with the many on the healing and repair of

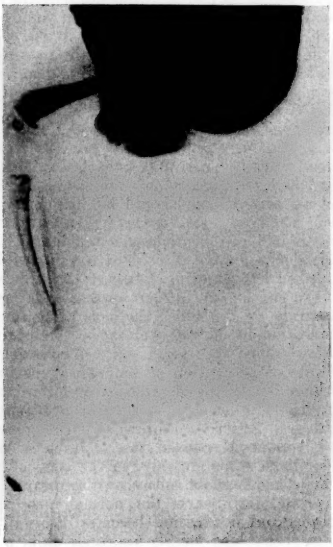

FIG. 3. The third stage of osteochondritis luetica. The distal end of the femur shows an infraction of the shaft, usually termed an epiphyseal separation. The upper extremity of the tibia also shows changes of the third stage, especially a marked area of rarefaction in the upper, anterior border of the diaphysis.

rickets, and the growing literature on the late stage of infantile scurvy since the work of Wimberger[6], Frank[7] and others has appeared. Sutherland and Mitchell[8] suggest that osteochondritis is a secondary lesion, rather than a tertiary, since the lesion at times undergoes complete healing without treatment, leaving scarcely a trace. Since this is the case it was difficult for them, in following cases undergoing treatment, to exactly determine the effect of such treatment. They noticed the shadow of the zone of temporary calcification became

broader and less intense, and trabeculae reappeared and became more dense. Irregular density at the end of the bone became gradually more regular, and normal growth occurred. Pehu[9] makes the statement that infants with well developed osteochondritis often do not survive.

RICKETS

In rickets the principal changes are seen in the zone of proliferating cartilage and in the columnar zone. The proliferating zone is increased chiefly by the multiplication of new cells, and it becomes more vascular than normal. (Holt.)[10] The columnar zone is affected in the same way to a greater degree. Large vascular channels are formed instead of but few blood vessels as in normal growing bone. The large vascular channels are sometimes surrounded by medullary spaces. Since rickets is a disturbance of the equilibrium between deposition and absorption of calcium in the growing bone, as a result there is an increasing deposition of uncalcified or osteoid bone in place of normal calcified bone. The ossification zone, where the primary spongy or cancellous bone is formed, instead of being narrow and sharply outlined, is broad and very irregular. Masses of cartilage take up areas which should be completely calcified, while only small areas of calcification may be seen in large cartilaginous regions. As the process goes on the osteoid or uncalcified bone is applied in increasing extent to the trabeculae and the endosteum, in more or less wide layers. According to Erdheim[12] the zone of temporary calcification in normal ossification, maintains a constant shape and depth, since during growth, the rate of absorption of the primary growing cartilage is adjusted correctly in relation to the deposition of lime in the zone of proliferating cartilage. Absorption during rickets goes on, sometimes at a reduced rate, but calcification of cartilage stops entirely, so the zone of temporary calcification entirely disappears. As this zone disappears, the normal process of endochondral ossification becomes disorganized, the marrow blood vessels lose their axial alignment, and spread irregularly through the zone of proliferating cartilage, and form an irregular network with the vessels of the cartilaginous matrix. In between, a fibrous uncalcified bone tissue is laid down.

As the rachitic process proceeds, the deposition of calcium ceases, but the proliferation of cartilage cells goes on, and as this growth goes on, row after row of cartilage cells becomes added to the rachitic zone. (Schmorl.)[11] Deposition of cartilage in the process of repair does not begin at the old bone-cartilage junction but at the place where it would have taken place if rickets had not developed, (Schmorl) that is, at the end of the zone of rachitic proliferation farthest from the shaft. The formation of a new zone of temporary calcification serves as a check on the rachitic proliferation in the growing cartilage tissue, and normal growth again makes a beginning from the new temporary zone of calcification. Behind this zone, increasing calcium deposition goes on in the process of absorption and deposition, and thus

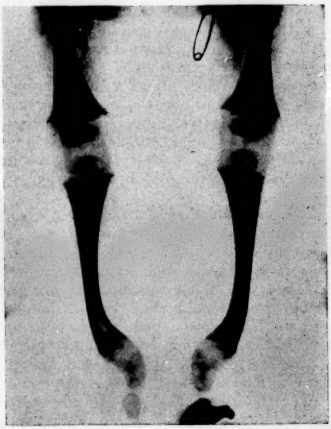

FIG. 7. Rickets in the stage of well advanced healing. The persistence of the zone of osteoid, not yet completely calcified tissue can be seen in the upper extremities of the tibiae.

the osteoid tissue that has been formed during the course of the disease becomes transformed into bone.

If a relapse occurs, as first pointed out by Schmorl, the new zone of temporary calcification will be broken through, and the line of calcification corresponding to the period of healing will be buried in the widened distal portion of the diaphysis. Occasionally several of these buried or partially buried lines of calcification may be seen, indicating as many attempts at healing with relapse.

Wimberger has described two types of florid rickets, the passive and the active. The former is found usually in severe cases, the child lying on his back and not moving the extremities. The active type is found in those children who show, in spite of their illness, a good state of nutrition and good bodily activity. In the passive type on the roentgenogram the line of the zone of temporary calcification shows thinning with a finely frayed out appearance of the edge. There is none of the so-called "cupping." The dense, homogenous calcified margin of the zone of temporary calcification is lacking and the fraying of its edge is due to the half-calcified trabeculae which can be traced into the resting cartilage of the epiphysis. The spongy and compact bone shows a wide meshed structure. If the rachitic process develops slowly the zone of temporary calcification only gradually dis-

appears proportionate to the rate of progress of the disease on the roentgenogram. (Wimberger.)

The active form is characterized by the well known cupping of the end of the diaphysis. The latter has a broadened swollen appearance. This is distinct only at the end of certain bones,

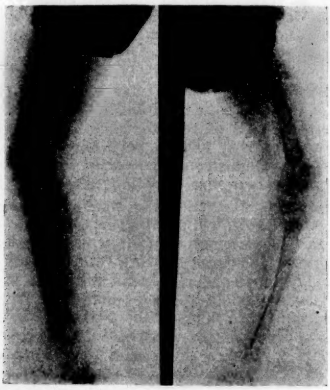

FIG. 5. The passive type of rickets (Wimberger). The diaphyseal ends show no broadening or cupping, and curvatures are slight, if at all present.

as the distal ends of the ulna, radius and tibia, and the proximal and distal ends of the fibula. The distal end of the humerus is never concave but always remains convex. Wimberger believes the shadow of the frayed out ends, running longitudinally from the diaphysis into the cartilage of the epiphysis on the roentgenogram are due to the trabeculae which still retain calcium, and also according to the duration of the disease, to the calcified remains of the old temporary zone of calcification. The excessive cell proliferation and division of the proliferating cartilage of the epihysis, due to the rachitic process casts no shadow. Thus, if the bone is actually increased in length, the length of the shadow of the diaphysis remains unaltered at the length it had attained before the onset of the disease.

On histological sections, the edge of cupped area is shown as a circular enveloping envelope, which is believed by Wimberger to be due to the calcium protective law of Erdheim[12]. The limited amount of calcium in the rachitic bone is deposited at the periphery, since the long bones suffer the greatest strain at the periphery. The calcium selects for its deposition, from the large amount of osteoid tissue, the site which offers the greatest available strength resulting from its deposition. The cupping on the roentgenogram is thus explained on a mechanical basis.

If the relapsing form is present, two or more transverse thin lines may be seen at the diaphyseal ends due to the formation of new zones of temporary calcification. These are freshly deposited and remain unabsorbed while rachitic osteoid tissue lies between and is the cause of the comparatively clear intervening spaces as shown on the roentgenogram.

On the diaphyseal side of the zone of temporary calcification the thinner trabeculae in the florid type disappear, casting no shadow on

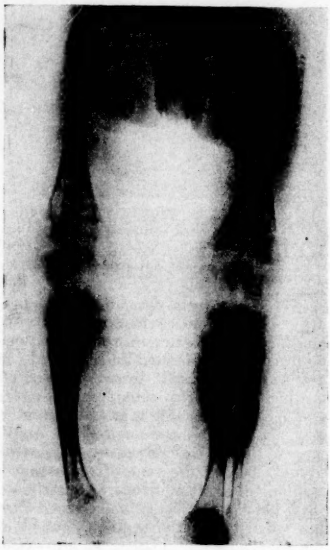

FIG. 6. Illustrates the relapsing type of rickets. Several distinct lines, representing new zones of temporary calcification, can be seen at the disphyseal extremities, especially well shown in the lower end of the left femur.

the roentgenogram, and as more osteoid tissue is formed, the thicker and coarser trabecula become more blurred. This coarsened structure persists for a long time after healing has begun. (Wimberger).

The formation of a new zone of preparatory calcification can be regarded as the beginning of healing. As healing progresses it becomes wider and denser. The rachitic osteoid tissue between the new and the old zones of temporary calcification shows longitudinal bands which gradually become thicker, as calcified replaces the osteoid tissue. As healing progresses stil farther, the irregular outline of the zone of temporary calcification becomes smoother on the side toward the cartilage. The rachitic zone (between the two zones of temporary calcification) shows a finely meshed structure and can be distinguished from the old diaphysis which is coarsely meshed. Wimberger states this ap-

pearance may persist for a year or more after the skeleton has apparently otherwise entirely healed.

SCURVY

In scurvy the zone of endochondral growth shows the following changes as described by Pelkan[13]. The zone of proliferating cartilage cells becomes distorted and evidence of mitosis is lacking. The zone of temporary calcification becomes several times broader than normal. It is well calcified but is much distorted. The blood vessels which invade this zone from the marrow cavity are few and small, wander, apparently, aimlessly about and do not enter the cartilage to carry on the normal processes of resorption. Immediately behind the zone of temporary calcification on the shaft is a zone of greatly weakened new bone. The spongiosa formed during the time when the scorbutic process was slowly retarding the formation of new bone is extremely weak. It consists of trabeculae of poor quality which no longer are covered by osteoblasts, or if osteoblasts are present, they are small of poor staining quality and obviously are nonfunctioning. The trabeculae have received no additional calcium. The lymphoid marrow of the normal bone is here replaced by the so-called framework marrow, consisting chiefly of connective tissue.

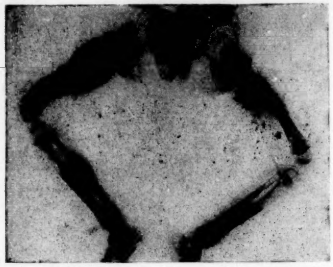

FIG. 4. Illustrates the first stage of infantile scurvy. The "ground glass" atrophy of the ends of the diaphyses, the distinct rings about epiphyseal centers of ossification, and the dense zones of temporary calcification are shown. The framework marrow zone, the rarefied band behind the dense zone of temporary calcification has not yet appeared.

These two zones as described by Pelkan are easily distinguished on the roentgenogram. The broadened zone of temporary calcification and the framework marrow zone behind it have been called the white line and the Trümmerfeldzone. Because of the resultant confusion, the terms as above used representing the histological changes are best employed to represent the changes on the roentgenogram thus obviating any confusion in terminology. (Bromer)[14]. Pelkan believes that the appearance of the zone of lessened density on the roentgenogram means that the case is one of well developed scurvy, and my recent analysis of cases at the Children's Hospital substantiates this opinion.

The broadened zone of temporary calcification appears in the early cases in the first roentgenographic stage of the disease. The zone of lessened density appears in the second stage when the clinical recognition is comparatively easy. These zones persist during the third stage of well developed hemorrhage.

The small projections called by Pelkan, lateral spurs, which appear in the late second or in the third stage, are found at the terminal end of the diaphysis, and are an early roentgenographic evidence of hemorrhage. They should not be confused with the semi-circular, enveloping shadows of the calcium deposition in the cup-shaped diaphyseal ends of rachitic bones. The lateral spurs are almost always perpendicular to the shaft, while the calcium deposition in rickets assumes a semi-circular or oblique direction.

In the fourth or healing stage the zones of temporary calcification become broader and denser. The framework marrow zone gradually disappears and becomes more calcified than the remainder of the shaft. In time the ends of the shafts show double lines of calcification stretching across them. This is due to the fact that as growth proceeds the heavily calcified zone of temporary calcification recedes toward the center of the shaft. Wimberger regards these lines as a measure of the growth of the bone during the healing stage and considers them as pathognomonic of scurvy when at the same time the characteristic changes in the epiphyseal centers of ossification can be found, namely the circular ring of increased density surrounding the epiphyseal center with the small area of ground glass density within it. Such lines of calcification are believed to be the evidence of any disease that has caused periodic cessation of bone growth and as such may be the late evidence of myxodema, rickets and other disorders.

SUMMARY

The roentgenographic appearance of the areas of endochondral bone growth, the diaphyseal ends, is definitely characteristic in the three diseases, congenital syphilis, rickets and infantile scurvy, and the study of these areas is most important for their differential diagnosis. Age incidence and other clinical manifestations have not been discussed. The roentgenographic changes are traceable to the underlying pathological processes and a knowledge of the latter is absolutely necessary for the interpretation of the roentgenogram. In rickets and infantile scurvy, the process of repair and healing has been more thoroughly studied than in congenital syphilis. The terminology, descriptive of the roentgenologic changes should be based entirely on the underlying pathological processes and should in this way obviate any confusion in the application of the various terms, which might arise if a less definite and descriptive nomenclature is employed. No attempt has been made to

describe changes in the endochondral zone of growth when any of these diseases is found in combination with another. This presents extreme difficulties and it is hoped will be the subject of a further report when sufficient material has been obtained.

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Discussion

CHAIRMAN O'BRIEN: The discussion of Dr. Bromer's paper will be opened by Dr. Philip Sylvester of the Children's Hospital, of Boston.

DR. PHILIP H. SYLVESTER: Dr. Bromer's paper is splendid. He has covered the subject in a most thorough and scholarly way. I agree with him absolutely that only by complete understanding of the pathology of these lesions may we be able to interpret the x-ray findings intelligently. He has left very little ground open for discussion, except for me to emphasize, from the point of view of a clinical man interested in congenital syphilis, the great value of x-ray interpretation in diagnosis; and in checking up treatment in this condition. We must remember that while clinically only 5% of congenital luetics show evidence of bony lesions, autopsy shows 80% and the x-ray, especially in the early weeks of life, shows nearly 100%.

In the first few weeks of life the Wassermann is often negative on the mother and likewise on the child, even in the presence of suspicious skin and visceral manifestations. Therefore, the x-ray findings are especially important in helping us to an early diagnosis, and hence to early treatment, which is vital.

(Lantern slides were then shown which emphasized these problems from the speaker's point of view and tended to corroborate Dr. Bromer's thesis, as follows:—)

1. Showing characteristic lesions in the bones of foetuses.
2. Showing bony and periosteal lesions in very young babies.
3. Emphasizing the essential points in differential diagnosis between Congenital Lues, Osteomyelitis, Rickets, Scurvy and Bone Tuberculosis.
4. Micro-photographs emphasizing the differential pathology of Syphilis, Rickets and Scurvy.
5. Serial slides showing progress of bony and periosteal lesions under treatment.

CHAIRMAN O'BRIEN: The discussion will be continued by Dr. McKhann of the Children's Hospital.

DR. CHARLES F. MCKHANN, Boston: I believe that everyone in this group has had, or will have the opportunity of using the information which Dr. Bromer has given us. If there is one of these three diseases which he has discussed which is not diagnosed, that one I think is scurvy. At least that has been the condition at the Children's Hospital up to the last two or three years. In three years there were admitted to the Children's Hospital of Boston 150 proven cases of scurvy. One hundred and twenty of these 150 cases came from within ten miles of the State House.

Of these 150 cases only 2 were sent into the hospital with the diagnosis of scurvy. The rest of them came with various other diagnoses,—injury leading; osteomyelitis running a close second. So I think if you will bear closely in mind what Dr. Bromer has told you about the early diagnosis of scurvy, you will aid very materially in reducing the number of fractures and osteomyelitis cases which come to a hospital.

There is not very much which I can add to the pathology of this condition but, as Dr. Bromer has said, there are three locations in the bones where we find roentgenologic changes in scurvy. One is in the shaft, in which there is a homogenous appearance; the second is a halo appearance around the epiphysis, and the third is this change in the growing end of the long bone. The symptoms of scurvy are due to the pathology in this growing end of the long bone. In this area of diminished density back of the white line which Dr. Bromer has pointed out to you, there occurs a hemorrhage, resulting from shearing of the small capillaries. The bleeding into this lower end of the long bone pushes up the periosteum and results in subperiosteal hemorrhage at the end of the bone, so that there appears the late signs of scurvy which everybody recognizes.

(Slide.) No one would miss the fact that there is here a perfectly tremendous subperiosteal hemorrhage. There has been separation of the growing end of the long bone and complete

outward displacement of the distal end of the bone.

(Slide.) This is of some interest because it shows something important in healing of bones,—namely the flowing of bones into the lines of stress. All of that large hemorrhage is gradually absorbed and the bone is laid down again in the lines of stress, and in the course of time that child will develop a new shaft leading to the old epiphyseal line.

I have other slides of the earlier changes of scurvy but Dr. Bromer has covered this so thoroughly that I don't believe it is necessary to show them. (Applause.)

CHAIRMAN O'BRIEN: The next paper on the program is "Electrosurgery," by Dr. Edwin N. Kime of Indianapolis.

DR. EDWIN N. KIME: *Mr. Chairman and Members of the Massachusetts Medical Society*—It is indeed a pleasure and an honor to address the oldest organization of medical men gathered as a radiological section of a state organization of medical men. In the practice of modern medicine we would indeed be handicapped without the utilization of the electromagnetic energies, both for diagnosis and for the treatment of disease; also for preventive and for curative treatment of diseases.

The papers we have listened to this morning have been mostly along the line of constructive methods of the utilization of physical agencies or along the line of their utilization for diagnosis. I wish to consider with you the destructive methods, particularly the application of the high-frequency currents for the destruction of pathological tissue. Electrothermic surgery, or as Harvey Cushing and others prefer to term it, electrosurgery simply means the utilization for destructive purposes of a high-frequency current within the tissues to be destroyed. There are many different terms appearing in the literature, such as surgical diathermy, thermocoagulation, and so forth, but they can all be properly grouped under the term "electrosurgery."

ELECTROSURGERY*

BY EDWIN N. KIME, M.D.†

"OF all means employed in the destruction of pathological tissues the only certain method is that of heat". This dictum of Doyen[1], promulgated in 1907, was based upon extensive experimental and clinical studies in electrocoagulation. A year later, Nagelschmidt[1] demonstrating a similar technic before the Buda-Pesth Congress coined the word "diathermy", to indicate the postulated penetrative property of the biterminal high frequency current. "Diathermy" literally translated signifies "heating through", and fails to convey the meaning to the average mind of the conversion WITHIN the tissues themselves of electrical energy into caloric energy. Hence it fails to differentiate true electrothermic destruction of tissues from the heat necrosis produced by conductive heat as delivered from the actual cautery, or the cautery knife. Nevertheless, most authors still use the terms surgical diathermy and medical diathermy in discussing these various heat effects, the former resulting from a concentration of destructive heat units (in excess of 140° F.) and the latter of temperatures not exceeding physiological limits.

To Wm. L. Clark[2] and his associates belongs the credit for valuable pioneer investigations, both clinical, biophysical and histo-pathologic. Clark was the first to describe electrodesiccation, and to differentiate it from electrocoagulation and fulguration. Electrodesiccation and fulguration are similar in that they both are obtained from uniterminally administered very high tension, very high frequency, and very low amperage. In the former technic, which is much preferable, the needle is placed almost or quite in contact with the tissue to be destroyed, whereas in the latter (fulguration) the supposedly destructive spark is made to jump an air gap—and the usual result is superficial carbonization which insulates the underlying neoplastic cells, and prevents their destruction. Electrodesiccation is differentiated from electrocoagulation, in that the former is uniterminally applied and the latter biterminally applied. Histologically the difference is that to be expected from the application of a very mild or dehydrating agency with the production of mummification on the one hand, and the effects of much more destructive heat on the other. In the former, electrodesiccation, the cell outline is barely visible, the water having been literally boiled out and the protoplasm dried out. There is coincidently very little effect upon adjacent tissues, and consequently little sclerosis. Scar tissue production is minimal. In electrocoagulated tissues complete cellular necrosis with more or less inflammatory reaction of subjacent and adjacent tissue cells, thrombosis and later hyalinization of the blood vessels, small round celled infiltration and fibrosis. The latter factor may occasionally be exaggerated into a keloid, but as a rule this factor while more marked than with desiccation is much less troublesome than after either ordinary surgical excisions or after radiation. Electrodesiccation is indicated in superficial lesions, premalignant or of low grade malignancy, and

*Read before the Annual Meeting of the Massachusetts Medical Society, Worcester, Massachusetts, June 6, 1928.

†For record and address of author, see "This Week's Issue," page 566.

especially if located about the eyelids, face, nose, ears, or any place where scar tissue must be prevented at all costs. On the other hand in the more malignant epitheliomata of the lip, tongue, buccal mucosa, and extremities, usually squamous celled rather than basal celled in type, electrocoagulation even with more or less scar should be the agent of choice. Infectious granulomata and other accessible infections may be treated on the same basis—desiccation if small and superficial—electrocoagulation—as in carbuncles, large condylomata, etc. Clark[2] and his associates[2] have emphasized the necessity of utilizing in addition, good operative technic in preliminary ligation of main supplying vessels, and of postoperative radiation, when indicated.

In a paper of this scope it is not possible to even list all the various men who have published their work in electrodesiccation, or electrocoagulation. To show the versatility of their application, we might mention Corbus[3] et al. in genitourinary surgery, Novak[4] et al. in otolaryngology, McFee[5] in oral surgery, Willmoth[6] in gynecology and on carbuncle and many others.

However, in the hands of most surgeons who have attempted to use them the high frequency currents have left much to be desired. Many have questioned whether the end results were really any better after electrocoagulation than after the use of the cautery knife—as practiced by such master surgeons as Percy[7], Gatch[8], Scott[9] and others. In order to decide this issue, the only fair test would be the performance of the same technic on a large series of patients, in which the lesion was partly removed by conversive heat destruction—or electrocoagulation, and partly removed by the actual cautery—which acts by conductive heat methods only. To my knowledge this has as yet not been done. Experimental evidence is available to show the greater penetrating value of the high frequency current when applied to the same tissue through the same electrode as that which had previously been used in actual cautery technic—at cherry red. My experience with the two has so far been limited—so far as actual comparison is concerned—but seems to favor electrosurgery rather than conductive cautery knife. There is less charring—in fact by proper technic in electrosurgery there should be no charring. The patients suffer perhaps less discomfort, and wound healing is somewhat kindlier, quicker and with less scar. There is no need to compare either of the above methods with knife exeision followed by actual cautery. Scott[9] and others have shown the superior value of the cutting agency simultaneously administering the heat.

Another objection offered to coagulation by many surgeons is the necessity for circumvallation, or coagulating a circumferential zone about the lesion, in order that it may be excised through a bloodless field. Were rapidity of removal the only criterion, this objection might have weight, although if we consider the time lost in obtaining hemostasis by clamp and ligature the difference is not so marked. But in our effort to eradicate malignancy, any other factor except those which enhance the prospects for successful destruction and eradication of the neoplasm must be considered of secondary importance. In electrosurgery the ideal operation is one which destroys the neoplasm in situ, and excises it as a bloodless mass, leaving a wound whose lymph spaces are sealed and which is rendered sterile by the operation.

It is only within recent years through the labours of Wyeth[10], Howard Kelly[11], and more recently of Harvey Cushing[12] that we can see this ideal operation realized. The other two forms of technic of electro surgery—namely electrodesiccation and electrocoagulation, utilize the so called damped or discontinuous oscillations. In what Howard Kelly[11] terms the "New surgery" a so called cutting current, undamped or continuous oscillations produces within the tissues beneath the "acusector" a molecular disintegration, with a very slight electro-coagulative effect of the adjacent wound edges. This is sufficient to seal lymphatics and ordinary sized blood vessels. The operation proceeds with greater speed in the hands of the expert, than is ordinarily possible by scalpel, since hemostasis is or should be practically nil. The same principles of surgery however apply, and the method has this danger—that insufficient penetration of the destructive agent may occur, and there may be a greater incidence of recurrence. However this may be obviated by a judicious admixture of both the undamped and damped currents, as well as all the other agencies within the surgical armentarium. As differentiated from electrocoagulation, the cutting current type of electro-surgery is not only more rapidly carried out, but permits of wound closure with reasonable chance of primary healing.

At this point it is well to emphasize that although electrosurgery has already developed to the point wherein it must be considered as competitive with scalpel surgery, at least in the treatment of malignancy, yet it should be emphasized that it is safe only in the hands of a well trained operator, and must be utilized as a valuable adjunct to and not a substitute for well established chirurgical technic. The potentialities for disaster are even greater by the use of these newer methods than by the old, and in no case should one ever consider the ownership of a machine, and ability to operate it as a substitute for surgical judgment, skill and experience, or for surgical anatomy and pathology. On the other hand, the surgeon no matter how skilled in ordinary operative technic, must realize the necessity for a thorough mastery of the underlying principles of the apparatus used, should practice at first on dead flesh or on minor accessible lesions, and should actually test each agency himself, or provide himself with a com-

petent assistant who thoroughly understands the technical problems involved—before he attempts to deal with major lesions. In no other way can a fair test of the method be accomplished, and in justice to the patient and himself the surgeon should either master the technicalities of electrosurgery, or do teamwork with a competent electrotherapist.

The advantages of electrosurgery when thus properly done, may be listed as follows: the operation is more quickly performed, since less time is lost in obtaining hemostasis; anesthesia is less important—since most of the operations in which this method is indicated may be done under H.M.C. analgesia and local or regional anesthesia: postoperative pain and shock are either nil or much less than is usually to be expected for the reason that the sensory nerves are obtunded, there has been little blood loss, there is less acidosis because ether has not been used, and since the edges of the wound have been sealed—so that the lymphatics are closed there is less absorption of septic material into the circulation, and finally in that the wound has been sterilized, and if it later sloughs (as in electrocoagulation) the slough is not of the foully infected type which gives rise to sepsis. Desiccated wounds usually heal without scar—electrocoagulated wounds heal with scar—which is usually less than would be expected from tissue destruction of the same degree. Wounds after the use of the undamped cutting current can often be closed without drainage and primary union be obtained.

The following disadvantages and limitations should be kept in mind[13]. Whereas the operations are usually bloodless, proper technic makes this a matter of necessity[14]. With the damped currents, and some of the machines giving so-called undamped currents the operator is greatly handicapped by the presence of fluid in the wound. He must work in a dry field. This may necessitate ligation of the main vessel supplying the part, or may demand much wider and deeper circumvallation with electrocoagulation in order to dehematize the tissues which are bleeding. Many times however this can be avoided by picking up the bleeding point with a hemostat and applying the end of the active (biterminal) electrode to the clamp—just distal to the operators' fingers. Secondary hemorrhage following electrocoagulation is not due to infection as a rule, but due to partial destruction of the wall of a large blood vessel—not sufficient to result in immediate hemorrhage but later with coincident slough and rise of blood pressure—a dangerous even fatal hemorrhage may result. In a series of one hundred cases herein reported this sequela occurred in three or three per cent. In one case it was fatal, and in another the patient was saved by ligation of the main artery followed by blood transfusion. In the third case the vessel was caught at the site of the bleeding, but subsequent transfusion was necessary. Another disadvantage is the danger of the more commonly used anesthetics such as ether, ethyl chloride and ethylene. Cases of fatal explosions have already been reported in the literature. Gas-nitrous oxide—and oxygen may be used for short operations, and chloroform, with due regard for the well known toxicity of the latter, and its predilection for the heart and liver. Postoperative pain while usually nil, may be quite marked especially after local anesthesia injected beneath the periosteum. When local anesthesia is used the current density should be less, otherwise the extent of the coagulation may exceed the desired limits. Electrocoagulation in body cavities is especially dangerous in the hands of the tyro. Two recent cases of fatal issue after electrocoagulation of the tonsil—have come to my attention. In one of these a fatal hemorrhage followed from an aberrant internal carotid artery, and in the other the patient died from edema of the glottis before a tracheotomy could be performed. The fact that both these were performed in a doctor's office, by an operator not well skilled in the usual technic of tonsil dissection and snare may help to explain the reason for the surgical catastrophe, but nevertheless should serve as a warning to all who contemplate such dangerous operative work.

REPORT OF END RESULTS IN A SERIES OF ONE HUNDRED PRIVATE CASES

None of these have been operated within the past year. End results are evaluated from questionnaire returned from the patient or the referring physician, and the majority of these patients have been seen by the essayist from time to time within the past three years. Three groups of cases are reported, malignant neoplasms, premalignant neoplasms, and miscellaneous lesions of the infectious granulomata group. The technic in these cases was entirely with damped oscillations and with an ordinary high frequency machine such as was available at several different hospitals, and at the office. Careful diagnostic studies were done in all—although in many the lesions were so located as to make biopsy impracticable. The use of a cutting current should greatly facilitate the performance of biopsies. In all biopsies done on malignant cases—the patients were in class two of Broderus, except one fatal sarcoma, which although surviving the operation a year, had a Broderus four. As was to be expected the average healing time, and the presence of scar was greatly diminished in electrodesiccated cases as compared with electrocoagulated cases. On the other hand the recurrences were more frequent (60%) in the desiccated cases. In other words the operator must learn to be even more radical in each case than he thinks at the time to be absolutely necessary. The age incidence of the successful cases was higher than the unsuccessful cases. The two fatal cases were both under sixty, and recurrences were more frequent under sixty (90%). Only one poor result was obtained in a patient above sixty-five a recurrence of squamous celled carcinoma of the hand. The recurrence was not at the site of operation,

but above the wrist and did not develop until almost two years after the operation.

The following figures show end results in 100 cases:

Lesions	Cases	Reported	Cures	Failed	Complications and sequelae, scar, etc.	Recurrences	Died	% Total failures
Malignant								
One year	20	18	12	6	6	6	2	33%
Two year	11	9	8	1	2	1	0	11%
Three year	3	3	3	0	0	0	0	.....
Benign								
One year	19	18	16	2	2	2	0	11%
Two year	12	12	12	0	0	0	0	.....
Three year	9	7	7	0	0	0	0	.....
Granulomas—lupus, carbuncles, etc.								
One year	26	18	18	0	3	0	0	?
Totals	100	84	75	9	12	9	2	18%

The above figures are of cases followed too short a time to permit of any conclusions being drawn except that electro-surgery is not a panacea, but does possess some merit. If recurrence is apt to develop as it would appear within the first year or two, perhaps a closer follow up system will enable us to perform a second more radical operation, and thus increase our percentage of cures. In fact in all of the recurrences except three a secondary electrocoagulation was done, which up to date has been successful. In one of the three no operation of any sort was permitted, in a second case a successful amputation was performed by another surgeon—who reported cancer in the member at a distance of about one half inch from the zone of electrocoagulation—but apparently not affected thereby, and in the third case no report is available except that our operation had failed just as seven previous operations of different types had all failed. This man had sarcoma of the nerve sheath over the left musculospiral nerve. His right arm was monoplegic—otherwise amputation would long since have been performed. In his case we were too conservative in our effort to protect him against subsequent motor disability of his only usable arm, and hence failed. Apropos other treatment of the failures—many of these as well as many of those who were successfully treated had been radiation failures, by either or both Roentgen ray and radium. The latter two agents are considered to be however of value subsequent to operation, rather than preceding it.

ILLUSTRATIVE CASE HISTORIES

CASE 3. Mrs. P. Age 67. First photo—Fig. 1A diagrammatic view drawn on a photograph which had been made before neoplasm appeared. The diagram shows the approximate size and location of the ulcerated, infected, cauliflower like mass which involved the entire nose, both cheeks, nasion, and upper lip. This lesion had developed within five years, and had gradually increased from a verrucous patch along the left side of the nose, under frequent applications of a "fulgurating" current. Each time the current had been applied the surface char would subsequently drop off and reveal a wider spread lesion growing at the base. Subsequent radiation both by

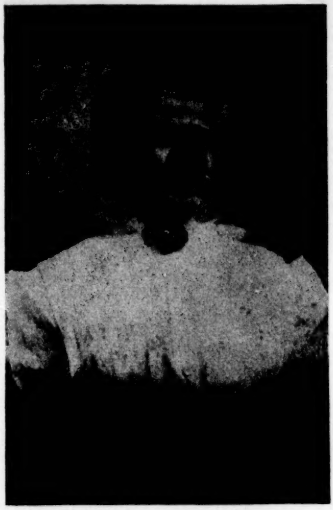

FIG. 1A. Mrs. P. Diagrammatic view of large cauliflower cancer of nose and face. Radiation resistant and inoperable.

x-ray and radium had failed to check its growth and she was sent to the Christian Hospital where heroic doses of x-ray had apparently no effect. I was called in to see her in April, 1926, and advised palliative removal of the mass by electrosurgery. Biopsy positive. Photographs unfortunately lost in the laboratory, hence this diagrammatic presentation of the lesion as it appeared before operation. The entire mass was excised without hemorrhage under general anesthesia. The left antrum was filled with pearly white tissue, and the lateral wall of the nose including the lower two turbinates had to be removed. Although not expected to survive the operation there was surprisingly little shock. One month later a second stage operation was done in which additional pearly white nodules were removed from back of the left nostril, and skin grafts were applied. These "took" perfectly and the wound healed over as shown in Fig. 1B. At the present time she is alive and well; there is no indication of any recurrence. The left nasolacrimal apparatus functionates, despite the fact that the inner canthus was involved at time of operation.

CASE 4. Mr. B. Age 72. Epithelioma of cheek—three years duration. Fig. 2A. Shows ulcerated cauliflower neoplasm of left cheek, with surrounding zone of inflammation and probably local extension. The neoplasm involved the entire thickness of the cheek, but had not ulcerated into the oral cavity. The upper and anterior portion of the parotid gland were involved, and also Stenson's duct and the middle radicles of the facial nerve. There was marked

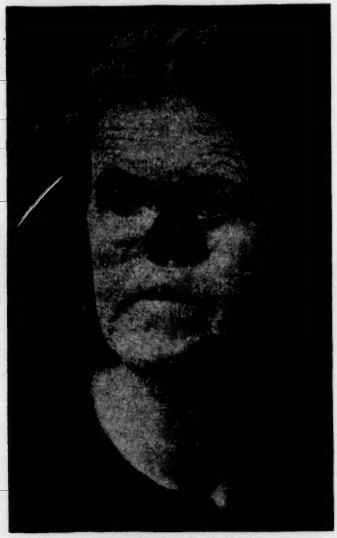

FIG. IB. Three months after electrocoagulation and excision. No recurrence in over two years.

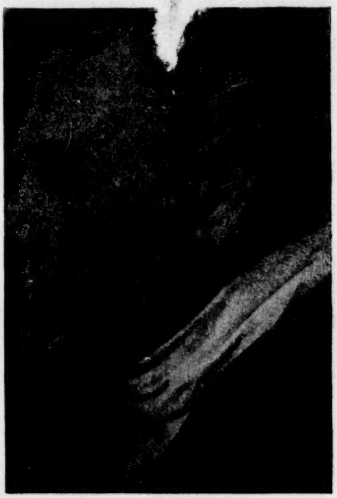

FIG. 2C. Mr. B. Four weeks after electrocoagulation and excision of cheek. Shows buccal fistula, salivary fistula and facial paralysis.

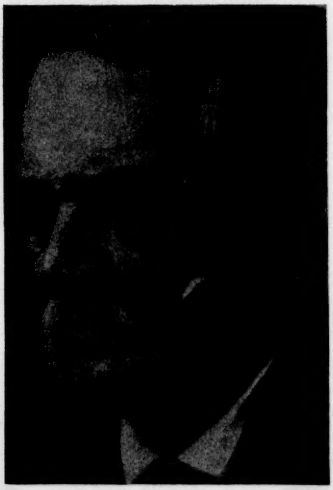

FIG. 2A. Mr. B. Squamous celled epithelioma of cheek—involving parotid duct and facial nerve. Trismus, pain, and ulceration.

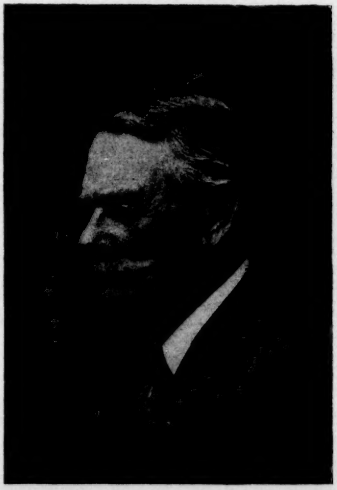

FIG. 2D. Mr. B. Eight weeks postoperative. No plastic. Complete healing. Patient has remained symptom free for more than a year.

trismus and pain following the use of arsenic paste on two previous occasions. Despite the gloomy prognosis which was given him, not only as to probable failure to cure but also with regards to buccal fistula, salivary fistula, and facial paralysis, the patient insisted that something be done to relieve him of the constant pain. Fig. 2B shows probably due to secondary infection following the arsenic paste that had been used several months previously. Fig. 2D shows the wound completely healed eight weeks after the operation. No evidence of recurrence or discomfort other than mild paresthesia of the cheek, up to date, about fourteen months postoperative.

FIG. 1C. This is the photomicrograph of case of Mrs. P. Epithelioma of nose. Type II—Broderus.

photomicrograph of the biopsy specimen—squamous celled carcinoma of the cheek—Broderus type two. Fig. 2C taken four weeks after the operation, shows the buccal fistula, salivary fistula and facial paralysis resulting from electrocoagulation and excision of the left cheek. Patient completely relieved of pain. Could also masticate and phonate well. At operation a half ounce of pus had been removed from the region of the left tempormandibular joint—this was

SUMMARY AND CONCLUSIONS

1. Electrosurgery is a valuable adjunct technic in certain selected cases, particularly in premalignant and malignant neoplasms, and the various infective granulomata.

2. Electrosurgery—properly administered requires first of all good surgical judgment and

operative skill, and secondly a sound and practical knowledge of the scientific principles underlying the technic of application of the various types of damped and undamped oscillatory high frequency currents for electrothermic destruction of pathological issues.

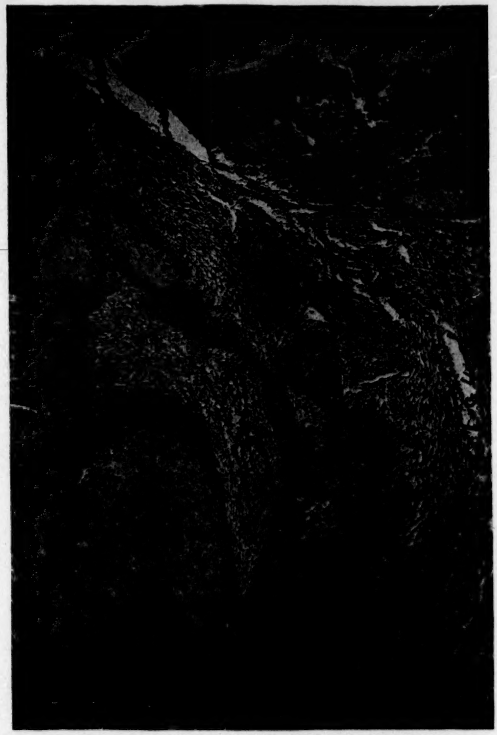

FIG. 2B. Photomicrograph shows Broderus 2 type epithelioma.

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Discussion

DR. HALSEY B. LODER: *Mr. Chairman, Ladies and Gentlemen*—I am very much obliged to Dr. Kime for giving us a personal demonstration of what can be done with electrical current as an

adjunct to surgery, and in the same breath I feel that I must apologize that in our part of the country very few men have done more than turn a shoulder to what is a real addition to our surgical equipment; not to replace operative surgery but to add to its effectiveness.

I would like to go one step further. Dr. Kime has shown you external cases rather than internal cases. There is just the same help for us in some of our otherwise hopeless or unsatisfactory internal cases that there is in the external cases, when these methods are properly used. My apology for our surgeons here has to go this far, in that I believe very few surgeons have ever used electrocoagulation in Boston, and yet I think a good many surgeons will say, "Yes, I have tried it and it wasn't good."

Electrocoagulation in its proper, true sense, means the application of a cold electrode, a needle, plaque or whatever it may be, to the tissues; the passage of a current through that electrode without any sparking or charring. In other words, is not to be started until after your electrode is actually in or in close contact with the tissues, and is to be stopped when the tissues are coagulated and carried no further. The mistake that most of our men have made—and it was my own mistake to begin with—has been that we did a lot of fulguration, some desiccation, and we got a nice charred surface with just a little tissue destruction and no coagulation.

A group of cases where coagulation is of the biggest help are those of malignancy in the mouth. One reason we have been slow in taking up this method has been that it came at just about the time when we were handing cases over to radiation that did poorly under surgical treatment. There are certain cases where radiation is ineffective, as our original surgery was, and with electrocoagulation we can go still further. In carcinoma of the tongue the difference between the old surgery for the carcinoma of the tongue and surgery by this method is about the difference between black and white. The removal of one-half, two-thirds, or a complete removal of the whole tongue can be done with the loss of perhaps one or two drams of blood; with no danger of pneumonia; and with a nearly painless convalescence.

Certain cases of carcinoma of the rectum that are inoperable in the major sense because of demonstrable metastases but still are obstructing carcinomas or near obstructing carcinomas, can be given great palliation if they can be seen through the proctoscope. They can be cut back by electrocoagulation, leaving a free unobstructed bowel with little tenesmus and but moderate diarrhoea. Thus the patient is given comfort in the few months remaining for him to live, without the questionable comfort of a colostomy.

I want to thank Dr. Kime for presenting this particular method. Let me reiterate, get it clearly in your minds what coagulation is, and does, then use in the appropriate cases. I thank you. (Applause.)

DR. E. H. TROWBRIDGE, Worcester: *Mr. Chairman*—I have gone one step farther in this subject of electrosurgical method. Besides using the coagulation and the desiccation in proper cases, I have used the electrosurgical knife, as presented by the General X-Ray Company, in amputations of the breast, in laparotomies, in suprapubic cystotomy, in appendicitis, I have made practically the entire cutting operation by the electrosurgical knife. There is one class of cases wherein I think the surgeon should recognize the splendid results in the procedure with this technique, namely, in abdominal adhesions following a previous laparotomy for whatever cause, I have relieved patients by severing the adhesions which could not be relieved in any other way, with the electrosurgical knife. I think this field alone presents to the surgeon one of the most distressing complications to be relieved by this technique as applied to such surgical cases.

I think we should all express a vote of thanks to Dr. Kime for describing the methods which he has demonstrated to us, and the technique which the surgeon should use.

The following officers were elected to serve for the ensuing year in the Section of Radiology and Physiotherapy:

Chairman, Dr. William D. McFee, Haverhill.
Secretary, Dr. Paul Butler, Boston.

CHAIRMAN O'BRIEN: Inasmuch as this room is promised to another section, I am obliged to declare this session adjourned.

The meeting adjourned at twelve thirty-five o'clock.

PERNICIOUS ANAEMIA

Results of Treatment With Liver or Its Derivatives in 67 Cases*

BY WYMAN RICHARDSON, M.D.†

THERE can now be no doubt as to the immediate beneficial effect of a substance present in mammalian liver and kidney when given by mouth to patients with pernicious anaemia[1 2 3 4 5 6 7 13 15 16 17]. Numerous reports from all over the country confirm the original observations of Minot and Murphy. The purpose of this communication is to summarize briefly our results at the Massachusetts General Hospital since beginning the use of liver, or its derivatives, in March 1926. It is not my purpose to compare the efficacy of various extracts with the use of whole liver or kidney. Many of our cases have already been reported on from this point of view by Minot and his associates[3]. The type of response in our cases has been entirely comparable to that originally reported by Minot and Murphy, and confirmed subsequently by numerous observers.

TABLE I

CASES NOW DEAD

Serial No.	Cause of death	RBC at death per cubic millimeter
1.	Anaemia and toxaemia	1,300,000
2.	Partial collapse of lung, pneumonia	1,600,000
3.	Pneumonia	3,000,000
4.	Post-operative pulmonary complication	3,200,000
5.	Coronary thrombosis	5,100,000
6.	Vena cava and mesenteric vein thrombosis	5,300,000

Since March 1926 there have been admitted to the Massachusetts General Hospital 84 cases of undoubted pernicious (Addisonian) anaemia. The diagnosis has been established by the usual criteria of suggestive clinical features, achlorhydria, and macrocytosis of the red blood cells. Of these 84 cases, seventeen have been discarded because of lack of co-öperation on the part of the patient (6 cases) or lack of sufficient follow-up data after discharge from the hospital (11 cases). The 67 remaining cases have been followed to date and their condition is known.

Six of these patients are dead. Two died of pneumonia, one, following cholecystectomy, of a post-operative pulmonary complication the exact nature of which is not known, one of coronary thrombosis, one of thrombosis of the vena cava and mesenteric veins. One died with severe anaemia and is discussed below.

Two of these patients had red cell counts of more than 5,000,000 per cubic millimeter when they died, two of about 3,000,000 per cubic millimeter, and one of 1,600,000 per cubic millimeter. (See Table I.)

Of these six deaths only one, case 1 in table 1 can possibly be attributed to pernicious anaemia, *per se*. This patient was admitted to the hospital in June 1927. There was doubt as to the diagnosis. Pernicious anaemia was suspected, but not proved; lead and arsenic poisoning seemed most likely. Fluoroscopic examination of the stomach revealed the presence of gastric polyposis. There was no evidence of bleeding from the gastro-intestinal tract. This patient was given 200 grams of raw liver daily and responded with a mild reticulocyte rise to about 6 per cent. and a steady red cell rise from 2,000,000 per cubic millimeter to normal levels. In spite of frequent letters this patient was lost sight of until a year later. He then returned with a red cell count of 1,000,000 per cubic millimeter, apparently having taken too small amounts of liver, although language difficulties made an accurate history impossible. Although large amounts of a known effective extract of liver were given, he steadily went down hill and died, in spite of a slight rise of the red cells to 1,300,000 per cubic millimeter and reticulocyte rise to 12 per cent. Autopsy, done by Dr. Tracy Mallory, suggested a toxic process and was not typical of death from pernicious anaemia. There was central necrosis of the liver with slight cirrhosis, and evidence of a mild interstitial nephritis. Examination of the bone marrow showed that active blood regeneration was taking place. There was present in the stomach a small, non-ulcerated benign polyp. I think that there can be little doubt that death in this case was largely due to some unrecognized toxic process.

Patient No. 2, recorded in table I, had considerable ataxia, which caused him to fall and fracture one or more lower ribs. This was followed by a partial collapse of the left lower lobe of his lung and pneumonia. When the patient died, 6 days after liver therapy was commenced, the typical bone marrow response to liver had started, the reticulocytes having risen from 1.4% to 6.4%.

Patient No. 3, recorded in table I, had done well with liver extract No. 343 (N.N.R.) until she developed an acute upper respiratory infection. The red cell count dropped from 4,300,000 to 3,000,000 cells per cubic millimeter in 6 weeks. At this time the dosage was increased from the amount derived from 300 grams of liver to that derived from 500 grams. Two weeks later a letter was received stating that the patient had died from pneumonia. No details are known.

*From the Medical Services of the Massachusetts General Hospital.

†For record and address of author, see "This Week's Issue," page 566.

Patient No. 4, recorded in table I, died of a pulmonary complication, possibly embolus, following cholecystectomy. No autopsy was obtained.

Patient No. 5, recorded in table I, began to have recurrence of anginal pain following resumption of activity. He died of what must have been coronary occlusion, according to information received from his physician.

Patient No. 6 was doing well, with a red blood cell count of over 5,000,000 per cubic millimeter, when he suddenly developed bilateral oedema of the legs and ascites. This gradually and slowly cleared up. Three weeks later he was admitted to the hospital as an acute abdominal emergency. Operation was regarded as impossible owing to the patient's poor condition. At autopsy there was fresh thrombosis throughout the branches of the mesenteric veins with necrosis of the bowel and an old thrombosis in the iliac veins and in the inferior vena cava.

From a study of these cases of pernicious anaemia that have died after commencing liver therapy, and from certain reports elsewhere[2,4], one gathers the impression that pernicious anaemia patients who have been adequately treated may be more subject to thrombotic processes than normal persons. It has been suggested[4] that transfusion of blood in the period of the reticulocyte shower and rapid increase of blood platelets may be undesirable because of the possibility of enhancing the development of thrombosis.

There remain, then, 61 living patients. Of these there are only 2 with red cell counts below 4,000,000 per cubic millimeter, one of 3,200,000 and one of 3,800,000 per cubic millimeter. These two low counts are attributable to the fact that both these patients failed to take a sufficient amount of effective material contained in liver. Now their liver intake is satisfactory and their counts are rising rapidly. The highest red blood cell count of any of the patients at present is 5,900,000 per cubic millimeter. The accumulated data concerning these 61 patients are presented below for 6 months periods.

TABLE II

Followed for	No.	Average RBC before Rx.	Lowest, Ave., Highest RBC after Rx.			Well	Not well	Remarks
6-11 months	25	1.5	4.2	4.9	5.7	24	1	1 patient with malignancy
12-17 "	13	1.3	3.8	4.8	5.6	13	0	
18-23 "	12	1.7	4.1	4.9	5.9	8	4	4 patients with mod. to marked C. N. S. symptoms
24 plus	11	1.3	3.2	5.1	5.7	11	0	
	61	1.5	average	4.9		56	5	

(RBC in millions per cubic millimeter)

It will be seen from Table II that the average red blood cell count for the group is 4,900,000 per cubic millimeter. Fifty-six of the 61 patients are classed as well. However, some of these patients still have slight paraesthesiae. One patient is not doing satisfactorily and complains of general weakness and fatigue and the red cell count has dropped from around five to around four million. She has been found to have carcinoma of the stomach; and also a tumor in the breast. Four patients have moderate to severe central nervous system symptoms, one of whom complains of a peculiar lower abdominal distress, the exact nature of which is not understood.

The literature contains a good deal of discussion concerning the effect of liver therapy on the disorders of the central nervous system. In this series there were 14 cases with definite ataxia. (See Table III.) Seven were classed as mild and 7 as severe. The diagnosis was made on the basis of a history of staggering and unsteadiness. It is difficult to determine whether or not there has been improvement by a study of objective signs alone. Although abnormal reflexes, interferences with bone conduction, and lack of position sense were often present, apparent changes in these findings might frequently be attributed to variations on the part of different observers. The patient's statement as to his ability to get around and do his work was taken as evidence of improvement; and if he made no complaint, the improvement was considered complete, even though objective signs might still be observed. On this basis, of the 14 patients with ataxia, 8 can be considered completely improved; there are four with moderate improvement, and only two with no improvement. The improvement takes place very slowly. Frequently no betterment was detected for six months or a year or even two years after liver therapy was begun; but certainly in the great majority of cases, if the red cell count is *constantly* maintained in the vicinity of 5,000,000 per cubic millimeter by the daily ingestion of adequate amounts of liver or liver extract, improvement can be confidently expected. Of course, in those cases that have progressed as far as to be completely bedridden, especially if there be involvement of the bladder sphincter, improvement can scarcely be expected. However, there have been some striking instances where improvement in such cases has occurred. One of our patients, once bedridden,

but without any sphincter disturbance, has become so much better that he is able to walk without any sort of support.

TABLE III

Followed for	No.	Improvement (Clinical)				
		Mild	Severe	None	Moderate	Complete
6-11 months	2	2	0	0	1	1
12-17 "	5	2	3	1	1	3
18-23 "	5	2	3	1	2	2
24 up	2	1	1	0	0	2
	14	7	7	2	4	8

There has been no case in which ataxia has appeared or progressed during treatment. From a study of patients coming to us with apparent progression of central nervous system symptoms during treatment we have concluded that liver has not been given in sufficient amounts and that the red cell count has often been allowed to drop to 4,000,000 per cubic millimeter or below. I believe that it is exceedingly important constantly to maintain the red cell level above 4,500,000 per cubic millimeter. The appearance of symptoms referable to the central nervous system calls for the use of extra large amounts of liver substance regardless of the red cell level.

It is recognized that improvement in ataxia may not mean actual nerve tissue repair. Increase in general strength, and muscle re-ëducation may play an important part. However, we are mainly interested in relieving the patient's symptoms.

Two of these 14 cases deserve special mention. Both of the patients had marked ataxia. One had to use crutches; the other could not walk at all. In both, vibration sense was absent over the tibiae, knee jerks were absent and Romberg's test was strongly positive. At the end of a year, the one who was bed-ridden has completely recovered symptomatically and the other is much improved, while in both knee jerks and vibration sense have returned, and there is very little swaying with the Romberg test.

It seems to me, therefore, that one is justified in talking optimistically to these patients. I go so far as to predict marked improvement; for it is essential to keep up the high liver intake, and unless the patient is hopeful of recovery, he will not do so. Great care should be exercised in maintaining the red blood cells above the critical level of 4,500,000 per cubic millimeter in order to prevent the progression or development of disorders of the nervous system.

Paraesthesiae invariably clear up. Occasionally they have remained for a year or more, in one case 2 years. In this case there has been a tendency for the red cell count to fall below the desired level because of an inadequate liver intake. In several cases, paraesthesiae have appeared during the period of the reticulocyte increase, only to disappear again when the red blood cell counts reached normal. Vague neuritic-like pains occasionally appear for a short while during this period.

There have been two cases of true psychosis. These patients had delusions of persecution and hallucinations. One of them had a red cell count of 3,600,000 per cubic millimeter and severe ataxia when liver therapy was begun. The psychosis entirely cleared up at the end of two weeks of liver treatment, and at the end of eighteen months the ataxia rather rapidly began to disappear. The ataxia and psychosis have returned following lapse in diet but are both again receding on the resumption of adequate liver intake. The other patient with a definite psychosis entered the hospital with a red cell count of 700,000 per cubic millimeter and a history of moderate ataxia. There was some unexplained delay in the response to treatment and two transfusions were resorted to. However, at the end of two weeks the red cell count started up, and the psychosis disappeared rapidly. At the end of six months there was no ataxia. In the first case mentioned, the psychosis cannot be attributed to cerebral anaemia; whereas it might be so attributed in the second case.

In addition to these cases of true psychosis, there were many patients whose excessive stubbornness practically amounted to a psychosis. Most of the patients classed as unco-öperative were of this type. In many others it took the utmost tact and patience to get them started on the right track. Once the response to liver is started, however, there is no more difficulty; and the change from surly and disagreeable obstinacy to smiling optimism and co-öperation is certainly as striking as the change to normal, after proper treatment, of the patient with hyperthyroidism or hypothyroidism.

One of the most frequent complications of pernicious anaemia has always been genito-urinary infection. In our cases this has varied from a very severe infection, which interfered materially with the normal bone marrow response to treatment, to a mild and fleeting infection of the bladder without pyuria. There were nine patients in this series who had definite bladder symptoms with pyuria. There were several more with transient nocturia and frequency, but without pyuria. Seyfarth mentions bacilluria occurring frequently in his cases[13]. I have no suggestion as to the cause.

Three of the patients had gastric polyposis. In every case, this diagnosis was made by roentgen ray studies before being suspected clinically. The history and blood findings of these 3 patients were those of pernicious anaemia. Their red blood cells varied from 1,000,000 to 4,200,000 per cubic millimeter at the time the polyps were detected. The response to liver was exactly the same as in uncomplicated pernicious anaemia. Two of these patients were operated upon. In

one, there was a single polyp which was removed. The patient did well for eight weeks without liver, but has subsequently had to resume it. In the other the polyposis was so extensive as to make removal impossible. This patient's red cell count was 2,000,000 per cubic millimeter and now is 4,900,000. She feels well except for occasional gastric distress. The third case is reported in detail above. (Case I in Table I.) It has been reported that the removal of benign tumors associated with pernicious-like anaemia will cure the anaemia[9]. This did not occur in the one case in this series where it was possible to remove the polyp. Polyposis of the stomach rarely, or never, occurs in the presence of free hydrochloric acid in the stomach contents; and it probably is associated with the gastric disturbance which is so much a factor in pernicious anaemia[10] [11].

The bone marrow response to treatment in our cases is comparable to that described by numerous observers. There occurs first a leucocyte rise, then a marked but transient reticulocyte rise, and finally a steady rise in the red cell count. Associated with the rise of leucocytes and reticulocytes there occurs a rise of the blood platelets. It is common for the count of the red blood cells to drop slightly during the first few days of treatment and this fact must be considered in determining the advisability of transfusion of blood. The haemoglobin lags behind the rise in red cells and the color index falls below 1.0. The speed and intensity of the regeneration depends on the red cell level at the start and the amount and effectiveness of the anti-pernicious anaemia substance used. The reticulocyte rise begins usualy about the fifth or sixth day and reaches a peak about the eighth or tenth day. In our series the peak varied from 8 to 56 per cent., depending upon the red cell level, for the percentage of reticulocytes at the peak is greater the lower the red cell level. The usual percentage of reticulocytes at the peak in our cases was in the vicinity of 20 per cent. The rate of red cell rise varied from 0.25 to 1.5 millions per cubic millimeter a week. Unless an adequate diet was provided, the rise from about three million to normal sometimes became very slow. Icterus, if present, disappeared before the end of the second week. No case in which there was co-öperation on the part of the patient has failed to respond.

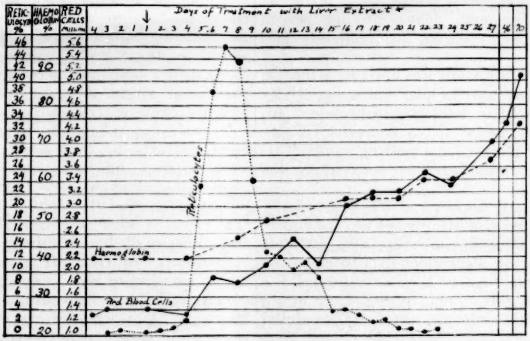

FIGURE 1
Bone Marrow Response to Liver Extract in a Case of Pernicious Anaemia

Reticulocytes in per cent.
Red Blood Cells in millions.
Haemoglobin (Tallquist) in per cent.

*Liver Extract No. 343 (N. N. R.)—the amount derived from 600 gms. liver, daily, for 2 weeks; from 400 gms. liver, daily, for the next 2 weeks; from 300 gms. liver, daily, thereafter.

TABLE IV

DIAMETER MEASUREMENTS BEFORE AND AFTER TREATMENT

No.	RBC	Before RBC	Before Mdn	Before Disp	After Mdn	After Disp
1.	2.0	3.5	8.1	1.4	8.0	1.1
2.	1.6	6.5	8.8	1.7	7.9	1.2
3.	1.0	4.6	8.7	1.4	7.8	1.4
4.	0.8	4.6	8.4	3.7	8.0	1.1
5.	0.8	4.5	8.1	2.1	7.8	0.9
6.	2.0	4.8	8.2	1.7	7.4	1.2
7.	1.6	5.9	8.1	1.5	7.3	1.4
8.	2.4	5.3	8.3	1.4	7.4	1.1
9.	1.3	2.1	9.0	2.0	8.4	1.6
10.	0.8	2.6	8.6	2.1	8.0	1.5
11.	1.4	5.3	8.5	1.5	7.8	1.1
12.	1.3	3.4	8.5	1.6	7.9	1.3
		Average	8.4	1.8	7.8	1.2

Diameter measurements of the red blood cells, where made, have returned to normal when the red cell count has returned to a normal level. (Table IV.) The normal median diameter is considered to be between 7.5 and 8.0 microns. The dispersion figure represents the degree of variation in size. Normal variation is from 0.9 to 1.2. Table IV shows that where the red cell count has risen to normal, the median diameter has fallen to normal, and that, while the dispersion tends to do likewise, it has sometimes remained slightly higher than normal. One case, however, which is not included, had a median diameter of 7.2 per cent. with the red cells at 600,000 per cubic millimeter. The dispersion figure in this case was high (1.74.). Most of the measurements given above were made by Francisca K. Thomas[12]. These findings are in accord with those reported by Madeiras and Minot[12].

After the red cell count has reached a normal level, the stained blood smear looks essentially normal. There may be slight achromia. An eosinophilia, of from 8 to 25 per cent., is frequent, and may persist for a year or more. This is important to recognize when considering the use of raw liver.

The symptomatic improvement appears simultaneously with, or slightly preceding, the beginning of the reticulocyte rise. Similarly, patients in relapse following insufficient liver intake often begin to feel poorly before the red cell count has dropped appreciably. The improvement often begins remarkably suddenly. One patient stated that he could tell "the instant the change took place." There is a sudden feeling that all is well. Appetite returns and restlessness disappears. Soreness of the tongue, if present, quickly goes. The patient shows often a considerable flushing of the cheeks, although the red cell count has not changed. Several observers have commented on this fact. From this point on the patient rapidly gains strength, and the bowels tend to move normally, whether constipation or diarrhea was the rule before treatment was started. Frequently, during the first week, there is a transient, but fairly severe diarrhea, which must not discourage the continuation of the anti-pernicious anaemia substance. By the end of six or eight weeks, these patients seem to be normal in every respect. The tongue may become normal in appearance, even though previously atrophied; the spleen can no longer be felt; and the blood pressure rises to normal levels. In two months, more or less, work of any sort can usually be undertaken.

No data have been obtained in this series concerning the return of hydrochloric acid in the gastric juice. Numerous reports indicate that it does not return, although McPeak and Neighbors[14] recorded that it did in one case. In the literature there are now reports of 70 or more cases where examination of the gastric contents showed no return of hydrochloric acid at the end of a period of liver therapy varying from several months to one or two years[5 6 and others]. It seems to me probable that there are two types of pernicious anaemia, dependent upon a factor or factors of which congenital or acquired achlorhydria is the most prominent, and that in the acquired type, hydrochloric acid may conceivably again be found in the gastric contents.

Other interesting features noted in this series are the high incidence of a familial history of premature grey hair; the frequent history of a diet containing little or no meat (perhaps 40 per cent. of our cases), or of a diet high in butter and dairy products (mentioned by Minot, Meulengracht and others). Another interesting point is the frequent history of a period, more or less long, of general vague malaise, often associated with vague abdominal discomfort before any anaemia has developed. An important step would be, therefore, to recognize, according to MacKenzie's teaching, pernicious anaemia in its prodromal stage, and, by adequate diet and hygiene, prevent its occurrence.

Transfusions of whole blood were done on eight patients in this series. These patients were so sick on admission that transfusion seemed necessary to tide them over the early period of treatment. I have mentioned earlier that there is some evidence that suggests that transfusions of blood during the reticulocyte response are unwise. It is well, therefore, to decide whether or not a transfusion is to be undertaken before beginning liver treatment. However, it is astonishing how infrequently transfusion seems to be necessary.

These patients received the anti-pernicious anaemia substance in many different forms, such as cooked and raw liver, cooked and raw kidney, and a variety of experimental fractions of liver, and liver extract No. 343 N. N. R. However, there is one point to emphasize, namely, that most of our patients have done very well on raw liver. They find it easier to take than cooked liver, and much easier to keep up. So far, no case of parasitic infestation has been discovered. The expense of the commercial extract has usually been prohibitive for many of the patients in this series. When patients have become unable to take raw liver, the broth from boiled liver has often tided over the crisis. With the use of a little time and patience, it has not been found difficult to get our patients to keep up their liver intake except in rare instances.

At present we consider the average maintenance dose of raw liver to be about ¼ pound (120 ± grams) daily; of cooked liver about ½ pound daily (200 ± grams); of liver broth the amount derived from 2 pounds (900 ± grams) of liver every three or four days; of liver extract No. 343 N. N. R. the amount derived from 200 to 300 grams of liver daily. All these weights refer to the raw substance before preparation. There is considerable individual variation, and the amount of liver necessary to main-

tain health in each case can only be determined by clinical trial and by careful observation of the patient. It is well to remember that in the presence of infection more than the usual amount of anti-pernicious material will be required and that if symptoms referable to the central nervous system appear, extra large amounts must be given.

We have used diluted hydrochloric acid U. S. P. spasmodically in those patients who have had a persistence of gastro-intestinal symptoms, and also occasionally where we felt that the response was not commensurate with the amount of anti-pernicious anaemia substance being taken.

SUMMARY AND CONCLUSIONS

1. Of 67 cases of pernicious anaemia followed at the Massachusetts General Hospital for a period of six to 28 months, six are dead. Five died from causes other than pernicious anaemia, and one with probably a complicating toxaemia. Four patients have moderate to marked central nervous system symptoms, and one patient has gastric carcinoma. Fifty-six are well.

2. This series confirms in every way the observations first reported by Minot and Murphy concerning the strikingly beneficial effect of liver therapy for patients with pernicious anaemia.

3. Central nervous system symptoms can, and frequently do, clear up, either entirely, or to a greater or lesser extent, following months or years of treatment, provided an adequate liver intake is maintained. It is essential to keep the red cell count above 4,500,000 per cubic millimeter in order to prevent involvement of the central nervous system. No case in this series has developed central nervous system symptoms during treatment, with the exception of occasional early and transient paraesthesiae and neuritic pains.

4. It should be possible to recognize the disease in its prodromal stage and thus prevent its more usual manifestations.

5. In eleven cases where the measurements of the red cell diameter were done, the median diameter has returned to normal, or below, with the return of the red cell count to normal levels.

6. The use of liver, or its effective derivatives, in patients with pernicious anaemia is more constantly and strikingly beneficial than is any other single therapeutic procedure in medicine.

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TREATMENT OF CHRONIC INFECTION OF SUBMAXILLARY GLAND

BY FREDERICK E. GARLAND, M.D.,* AND MOSES H. LURIE, M.D.*

CHRONIC infection of the submaxillary gland is uncommon but not rare and should be considered as a very serious condition. In all cases presented in this series, calculi were present. Stones in Wharton's duct *without glandular involvement* are more common and easily treated by removal through the mouth. On the other hand, chronically infected submaxillary glands offer possibilities of serious complications, and require far more radical surgery and judgment as to when to interfere.

Removal of the submaxillary calculi *through the mouth* with drainage of the gland *through the mouth* does not cure the condition any more than the removal of gall stones cures gall bladder disease.

The total removal of the gland by the external method is believed by us to be the simplest and quickest way of relieving the patient of his condition, and prevents any dangerous complications that might arise by the spreading of the infection.

*For record and adress of author see "This Week's Issue," page 566.

ANATOMY OF THE SUBMAXILLARY GLAND

The adult submaxillary gland is really composed of two segments:—(a) main gland; (b) accessory glands.

(a) The main gland is placed partly in the

submaxillary triangle and partly under cover of the posterior part of the mandible near its angle. It is enclosed in a complete capsule derived from the deep cervical fascia; embedded in this capsule, and superficial to the gland, are found a few submaxillary lymphatic glands, which are of importance owing to their connection with the lymphatics of the lips and of the anterior half of the tongue.

The superficial or inferior surface is covered by the deep cervical fascia and the platysma, and is crossed by the facial vein, which lies superficial to the gland, whilst the artery passes *in part beneath it.* The external surface rests against the inner aspect of the lower jaw (submaxillary fossa) an inch and a half forward from the angle. The deep or internal surface lies on the posterior part of the mylohyoid muscle, and behind this, on the hyoglossus and the posterior belly of the digastric. *The gland is not contained within the limits of the submaxillary triangle, inferiorly, but passes down some little distance over the digastric muscle.* From the deep surface, anterior to its middle, a narrow tongue-like deep process is continued forwards beneath the mylohyoid muscle along with the duct.

The posterior end of the gland, which is its most bulky portion, either abuts against, or lies close to, the sterno-mastoid, and is often overlapped by the lower end of the parotid gland. The facial artery, on its way to the border of the mandible, lies in a groove in the upper and back part of the gland.

(b) The second portion of the submaxillary gland is composed of a group of smaller gland masses, for the most part placed above the mylohyoid, which empty by small separate ducts into the main submaxillary canal. These are the accessory submaxillary glands and ducts. They vary greatly in number, position, and in the arrangement of their ducts.

In all these forms, the ventral accessory submaxillary gland is characterized by its forward extension along the floor of the mouth in intimate relation with the sublingual glands. The secretion drains in a direction back into the main submaxillary duct near the hilus. In a few adult human subjects the site of the usual ventral accessory gland is occupied by a submaxillary component whose duct is directed forward, accompanying the main submaxillary duct, into which it opens after a longer or shorter independent course.

In considering the relations of the gland, it is well to remark that there is in this region a three-sided space bounded externally by the inner surface of the mandible below the mylohyoid ridge, internally and above by the mylohyoid muscle running inward and downward, and below by the skin and fascia passing from the margin of the jaw obliquely inward and downward to join the side of the neck. In this space the gland lies with external, internal and inferior surfaces corresponding to the walls of the space.

The submaxillary, or Wharton's duct leaves the deep surface of the gland about its middle, and runs forward beneath the deep process of the mylohyoid muscle, along the upper and inner aspect of which it is placed. Pursuing its course forward beneath the floor of the mouth, on the inner side of the sublingual gland, the duct crosses the hyoglossus and the genioglossus muscles, and finally opens on the floor of the mouth at the side of the frenulum linguae; where its small orifice is placed on the summit of a soft papilla (caruncula sublingualis) close to its fellow of the opposite side.

The duct, which is about two inches long (50 mm.), is crossed on its inferior aspect by the lingual nerve near the anterior border of the hyoglossus, that is about opposite the 2nd molar tooth. The nerve at this point is arching from the posterior end of the mylohyoid (against which it lies) inward and forward in order to reach the under surface of the tongue, and in this course it passes *beneath* the duct. The calibre of Wharton's duct is much greater than that of the orifice by which it opens; for this reason it may be looked upon as forming, to some extent, a reservoir for the saliva,

Vessels and Nerves. The arteries come chiefly from the facial and its submental branch; the veins are similarly disposed. The nerves are derived from the submaxillary ganglion (which lies above the deep process of the gland), and are composed of fibres from the chorda tympani, from the lingual, and from the sympathetic on the facial artery. The lymphatics pass to the submaxillary lymphatic glands.

7th Nerve. Special attention is called to the mandibular and the ramus coli branches of the 7th nerve, which runs along the angle of the jaw. Their position is not constant and care must be taken in operating not to cut these branches, especially the mandibular, as it will cause paralysis of the lower lip.

PATHOLOGY

Salivary calculi form in the glands themselves, or in their excretory ducts, the latter being the more common situation. Calculi form in the salivary glands and ducts less frequently than in the kidneys or liver. Though some of them may be caused by some foreign body which has entered the duct, it is probable that, like stones in other situations, they are due to the presence of bacteria; these, with the change in mucous secretion they cause, furnish the matrix of the stone. If there are more than one, the stones are usually small.

A stone in the duct may cause no symptoms for a long time and will not do so until there is partial obstruction, or until infection occurs. Infection around a stone causes swelling, pain, and possibly suppuration or a diffuse cellulitis. As the result of one or repeated inflammations,

the stone lies in a bed of scar tissue, in an abscess, or in a mass of granulations and indurated tissue. The last condition has been mistaken for a malignant growth, and extensive operations have been performed. When a stone lies in an indurated mass, which is attached to the bone, it may be mistaken for a periosteitis, and the real cause overlooked. If untreated, a stone may lie in its bed indefinitely, with or without marked symptoms, or may eventually ulcerate its way through into the mouth, very rarely to the external surface.

Pathological examination of the specimens removed in all of the cases showed chronic degeneration of the gland and chronic infection. The stones removed have varied in size from a pea to that of a lima bean.

SYMPTOMS AND COURSE

The symptoms of an acute obstruction of Wharton's duct are: (1) great pain, made worse by eating, or by the sight of food; and (2) a fusiform swelling corresponding to the duct, with swelling of the gland; pain at night, referred to ear on the same side.

With suppuration, symptoms resembling Ludwig's angina may develop. The trouble often starts with a subacute swelling, which may remain quiet for some days or weeks, but when it becomes active, the swelling spreads rapidly until the whole floor of the mouth and submaxillary region may be involved. At first the skin is not red but pale, and does not pit on pressure. There is little constitutional disturbance, and though the patient will usually hold the mouth slightly open, he drools on account of difficulty with swallowing, and feels more comfortable sitting up. This spreading infiltration of the soft tissue binds all the structures into a hard board-like mass. The swelling is attached to the jaw bone on the side and presses the tongue upward and backward in the pharynx. Within the mouth the induration may be felt on the floor, and the sub-mucosa may be so edematous as to rise above the level of the teeth in a gray roll.

TREATMENT

In treating these cases operations through the mouth have been found unsuccessful. An attempt to drain the submaxillary gland and to remove the stone through the mouth is not only unsuccessful but dangerous, as in some cases the stone is embedded underneath the mylohyoid muscle and cannot be removed without the danger of damaging the facial artery and vein by working in a blind pocket.

We have found the external method through the side of the neck the easiest and simplest mode of treatment. An incision following the line and direction of the anterior and posterior digastric muscle, curve downward, is made about two finger breadths below the border of the jaw. This incision is about 1½ inches to 2 inches in length, and is purposely made low to avoid the 7th nerve. The platysma is cut through and with retractors the capsule of the gland is exposed. The submaxillary gland is identified, and an attempt to remove it *in toto* is made. The capsule is split and the dissection done with blunt dissectors and curved Mayo scissors. The vessels are ligated as they are encountered. The submaxillary *artery* is usually met towards the end of the operation. The facial *artery* may not even be seen in the field of operation. The facial *vein* can be pushed aside in some cases and in others must be ligated and cut. Traction is made on the submaxillary gland by means of tenaculi, and in pulling the gland upward and backward and then forward, there is little difficulty in shelling the gland out. Wharton's duct is identified, ligated and cut. When the gland has been removed, the stone may lie free in the space between the submaxillary gland and the mylohyoid muscle. After removal of the submaxillary gland the digastric muscle can be seen with its attachment to the bone. The mylohyoid muscle can also be seen, and the whole cavity is covered with part of the deep cervical fascia.

The wound is closed in two layers with interrupted sutures through the platysma muscle and interrupted sutures in the skin. Rubber dam tissue drains are used in all of these cases. *Opening into the mouth is avoided.*

All cases operated on had marked relief within twenty-four hours from all symptoms.

The wound drains serum and a glairy mucus from three to five days. The rubber dam tissue is replaced until it is practically certain that there are no pockets. The wound tends to be completely healed at the end of two weeks. Skin stitches are usually removed between the third and fifth day.

The resulting scar is practically invisible at the end of six months. If the platysma has been sewed carefully, there is practically no retraction, and the scar seems to fall into the natural creases of the neck and skin.

In several of the cases of acute infection, poulticing was applied for the first two or three days in order to localize the infection.

In regard to complications we have had but few. In one case the lingual nerve was cut on account of the chronic infection around it and the submaxillary gland, making it impossible to dissect the nerve free. In another case we found accessory submaxillary ducts, which were ligated and cut.

In no case was any paralysis or deformity of the mouth noted. All cases are free of symptoms at the present time.

CASES

Mr. M. R., seen October 17, 1927, came in complaining of a great deal of pain in the right side of the face, difficulty in opening his mouth, and great deal

of difficulty with swallowing. Examination showed a stone in Wharton's duct with marked inflammatory reaction of the duct and right submaxillary gland. X-rays taken by Dr. A. S. M—— showed two calcified areas in the right submaxillary gland. A small stone at the opening of Wharton's duct was removed under cocain.

Oct. 18, 1927. Patient complained of a great deal of pain and discomfort. Temperature, 101. He could not swallow and was drooling saliva. Examination showed marked tenseness of the skin in the region of the right submaxillary gland and a board-like feeling. The mucous membrane was so swollen as to reach the level of the teeth on that side. Put on hot poultices and irrigations.

Oct. 24, 1927. Operation for removal of gland by external method. The right submaxillary gland was removed under ether without very much trouble. A large stone about the size of a hazel nut was found. The ducts were ligated and a small rubber drain put in the wound. The lingual nerve was bound down on account of the inflammatory reaction around the stone, and it was cut in the removal of the gland.

Oct. 25, 1927. Twenty-four hours later, patient is very comfortable.

Nov. 2, 1927. Wound is completely healed. Patient sent home. Complains of loss of sensation in tongue, but was reassured that it would gradually come back.

Aug. 2, 1928. Patient has had no more complaint of submaxillary gland trouble, but had small canker on right side at the frenum. Sensation of tongue is almost normal.

Miss G. M. H., seen Feb. 4, 1928, with acute swelling of left submaxillary gland, temperature of 102, and an infection around the mouth of Wharton's duct. The patient gave a history of having had several calculi removed through the mouth in past years. The last operation was done about six months ago. Since then she has had swelling and pain in left submaxillary gland off and on. The present attack started one week ago. Two small stones having ulcerated through side of Wharton's duct were removed. Much pus evacuated through the mouth. Patient sent to hospital and put on hot douches and poultices.

Feb. 6, 1928. Temperature has dropped to 99. Mouth still shows edema and elevation of the mucous membrane from the opening of Wharton's duct to the second molar. There is considerable pain in the region of the angle of the left jaw.

Feb. 10, 1928. Mouth looks better. Patient advised to have gland removed by the external method.

Feb. 13, 1928. Left submaxillary gland was removed under ether. Gland found to be inflamed and was dissected with a great deal of difficulty, in fact, it had to be removed in sections. Large abscess was found in the posterior portion of the submaxillary gland.

Feb. 17, 1928. Stitches removed and rubber wick drain. Still considerable glairy mucous discharge.

Feb. 27, 1928. Wound completely healed.

Seen in April 1928, patient completely well.

Mr. J. D. P., seen in Sept. 1918. The patient walked into office with a chocolate milk shake, which he drank, and immediately had swelling of the left submaxillary gland. He had had streptococcus sore throat one year ago. A small stone was removed on the outlet to Wharton's duct.

Seen in 1919. He had had no further trouble from the submaxillary gland and has had no trouble since then.

Mr. E. W. S., seen June 2, 1928, with a question of throat trouble. Examination showed the nose negative; the tonsils were chronically inflamed. Tonsillectomy was advised at a later date.

Aug. 13, 1928. Patient reported that he had a little swelling in the right side of jaw, and that on feeling in his mouth he felt a lump on the floor of the mouth. Examination showed the right submaxillary gland a little enlarged and slightly tender. Digital examination of the floor of the mouth showed a stone in Wharton's duct at the submaxillary gland region about the size of a pea. This was removed under local anesthesia.

However, patient was warned that other stones might form, and if they did, the gland would have to be removed.

Mr. W. E. J., seen in April, 1927, gave a history that for years, off and on, his right submaxillary gland region would swell, especially during meal time. This would continue for one or two days, then he would have a discharge of pus and mucus in his mouth, after which he would get well. By milking it with his finger he was able to relieve his symptoms. X-rays by Dr. A. S. M—— showed a large stone in the submaxillary gland on the right side. Wharton's duct was probed the whole length and the stone was felt near the angle of the jaw. It was probed every four days from April 4th to May 27th. At that time x-rays were again taken and the stone was still in the same position. Advised to have gland removed but on account of his business conditions would not consider operation.

Sept. 1, 1927. Came in complaining of a great deal of pain. Duct was probed again and considerable pus and mucus was evacuated from Wharton's duct. Given hot douches in mouth.

Oct. 5, 1927. Reported with an ulceration in the floor of his mouth in the region of the second molar. On probing same a stone was felt and removed. Reported in three days and mouth was healing. No further symptoms.

Dec. 21, 1927. Mouth completely healed and the submaxillary gland is quite hard to digital examination.

Note:—This case illustrates nature's way of relieving this condition by the ulceration of the stone through into the mouth.

Miss M. F., referred by Dr. D. C.—— S—— in September 1927 for question of removal of stones in left submaxilary gland. X-rays showed a large stone in the left submaxillary gland. The patient had had small stones removed at previous times through Wharton's duct. The gland was removed *in toto* under ether on December 28, 1927. Patient discharged one week later and has been well ever since.

Miss E. L., referred by Dr. H. P. C——, was seen Sept. 10, 1928. The patient gave a history that for the past year she has been having trouble with swelling and pain in the left side of the jaw. She had been treated at the out-patient department of one of our hospitals by incision and draining of the floor of the mouth, and the condition partially helped for two or three weeks. She was last seen three months ago, when incision and drainage were again resorted to. Examination shows a tender mass in the region of the left submaxillary gland. Pushing this mass upwards, it presents itself on the floor of the mouth under tension, and is about the size of a walnut. The floor of the mouth shows considerable scarring, and complete obliteration of Wharton's duct. Attempts to probe Wharton's duct were futile on account of being unable to find the opening. X-rays taken by Dr. A. S. M—— showed three calculi in the region of the left submaxillary gland or in the floor of the mouth. Patient advised to have left submaxillary gland removed by the external method.

Sept. 18, 1928. Operation done under ether. Usual

incision made. Gland found to be distended and hard. Dissected and freed from the fascia without too much difficulty. Wharton's duct followed up and tied off near the opening into the mouth. Some of the sublingual gland also enlarged and hardened, was removed at the same time. Pressure in the mouth brought into view a large cyst the size of a hazel nut. This cyst was aspirated through the mouth, no attempt being made to remove the cyst through the external incision. It was planned to do this later through the mouth. Rubber dam tissue put in wound.

Oct. 4, 1928. Removal of cyst through the floor of the mouth. Cyst about the size of a walnut removed. No stones found. No stones found in the floor of the mouth by digital or direct examination. On looking at x-rays again what was thought to be stones are really calcified deposits in one of the cervical lymph glands.

Oct. 31, 1928. Mouth healing very well.

Nov. 19, 1928. Mouth completely healed.

Note:—This case has brought our attention to the fact that x-ray interpretation may be misleading. Attention being focused on the submaxillary gland and the possibility of a stone, no account was taken of the fact that a calcified lymph gland in this region may give a picture similar to that of stone in the gland.

REFERENCES

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RELATION OF ILLUMINATION TO OCULAR EFFICIENCY AND OCULAR FATIGUE

REPORT ON STUDIES MADE IN THE CHICAGO POST OFFICE

A report (Public Health Bulletin No. 181) of a study of the relationship of illumination to ocular efficiency and ocular fatigue among the letter separators in the Chicago post office, has recently been issued by Surgeon General H. S. Cumming of the U. S. S. Public Health Service.

This study was made in the main post office in Chicago from 1924 to 1926, in one of the sections of the mailing division. The purposes of the study were (1) to determine the degree of illumination under which the distribution of mail might be done with the greatest ease and efficiency; and (2) to demonstrate ocular fatigue, if possible, and to determine its relation to different degrees of illumination; (3) present knowledge of the relation of illumination to obtain any information that might add to the to the conservation of vision.

Seventy-eight men were employed in the Wisconsin section in sorting mail, some working as day clerks and some as night clerks. General lighting was installed in the section, the intensity of the illumination under which the men worked was varied by steps from 2.47 to 10.72 foot candles, and an investigation was made on the effect of the degree of illumination upon the speed of sorting mail. This was facilitated by the record kept by the post office of the amount of mail sorted daily by each man. Early in the investigation, however, it was found that not only the intensity of illumination but also the amount of mail to be sorted and the mental attitude of the worker affected the speed of sorting. Probably, as a result of the influence of these other factors, it was found that only for the sorting of small letter mail by the night shift, where there was a continuous and heavy supply of mail, could a marked relation be detected between the degree of illumination and rate of sorting. In this case, in going from an illumination of 2.7 to 10.7 foot-candles there was found to be an increase of about 8 per cent. in the speed of sorting.

On account of the difficulty in obtaining definite results for the routine sorting of mail, it was decided early in the investigations to parallel the routine sorting of mail with tests on a sorting of 1,000 specially prepared cards under varying degrees of illumination, from 2.41 to 17.67 foot-candles. These tests showed a marked relation of speed of sorting to degree of illumination, the "looking time," or the approximate time required to read the addresses on the cards, decreasing about 8 per cent. when the illumination was increased from 2.5 to 10 foot candles.

In an attempt to find the effect of the degree of illumination upon ocular fatigue, a special piece of apparatus was designed in which a broken circle was exposed as a test object for 0.011 of a second, and the subject being examined was required to tell the direction of the break in the circle. This is believed to involve a special form of visual acuity, which might by analogy be called "snap acuity," since the time of exposure is so short that accommodation and fixation in this case are negligible. The subject was tested shortly after beginning work in the morning, and again shortly before stopping work in the afternoon. Snap acuity was found to be slightly lower at the close of the day's work than at the beginning, but no relation was observed between snap acuity and the degree of illumination under which the subject had been working. It was found, however, that snap acuity improved after the subjects had worked under high illumination for a sufficient length of time, and correspondingly decreased after working under low illumination. This phenomenon has never been observed before, and is very important if it can be confirmed.

Periodical examinations were made of the eyes of the men. They showed that the percentage of refractive errors among the clerks examined was rather large. Fifty per cent of them wore glasses. The percentages of other ocular defects found during the examinations seem to agree with those previously found by the United States Public Health Service and other investigators.—*United States Public Health Service.*

MEDICAL HISTORY

CHARLES GREENE CUMSTON, M.D.*

DR. CUMSTON was born in Boston, Massachusetts, June 28, 1868, the son of James Schouler and Charlotte (Greene) Cumston. His father was of the firm of Hallett and Cumston, well known for many years as manufacturers of pianos. James Schouler, LL.D., writer and historian, author of the excellent "History of the United States Under the Constitution", was a cousin. His maternal grandfather was Charles G. Greene of the *Boston Post*, and an uncle, Nathaniel G. Greene, was for many years a writer for the *Post*. We may infer that from these forbears Dr. Cumston inherited a love for, and facility in, writing.

Dr. Cumston was a Boston school boy, for a time at Hopkinson's School. Later he was taken by his father to Vevey on Lake Geneva where he pursued his secondary studies at the Institute Sillig for a time. At the age of 17 he went with his family to Geneva, and while there his sister was taken ill with the measles. The kindly attending physician, noticing that her brother seemed to have a decided interest in things medical, gave him opportunities to visit the hospitals and clinics of Geneva, and, naturally enough, asked him why he did not remain there and study medicine. As the outcome of this friendly suggestion, Dr. Cumston entered the Medical School of Geneva where he stayed seven years, taking the degree of M.D. in 1893, said to be the first American to receive this degree in Geneva. The fact that he had previously studied in a school in French Switzerland and had a good knowledge of French makes it understandable that he should be willing to continue his studies in Geneva where he felt more or less at home.

The title of his graduating thesis was Contribution à l'Etude de la Virulence du Bacterium Coli dans les Diarrhées des Enfants. Under his name on the title page he wrote: Former student associate of the Royal Academy of Medicine of Dublin, former interne at the Rotunda Hospital of Dublin and former Surgical Assistant at the Butini Infirmary in Geneva. From this it seems that he must have studied obstetrics, perhaps in some of his vacations, at the noted Rotunda clinic in Dublin. This graduation thesis is now in the Boston Medical Library.

In spite of his fondness for Geneva and the Swiss, he decided to return to Boston and practice his profession there. I fancy that his parents may have felt that there was a better opportunity for a well-educated physician to succeed in a large, growing American city, where he had relatives and friends, than in the smaller Geneva. He was so fortunate as to be able to take back with him to Boston a young Genevese lady, Miss Clotilde Louise Kunkler, whom he married on October 5, 1893, just before leaving for America. She shared his life with him for thirty-five years and is now living in Geneva.

At first Dr. Cumston lived at his father's house on Beacon St., but after 1897 his home and office were at 871 Beacon St., where he remained while in Boston. He worked at the Boston City Hospital for a time, doing microscopic and pathologic work with Dr. Councilman. From 1894 to 1896 he was instructor in gynecology at Tufts Medical School and from 1896 to 1900 assistant in pathology at the same place. For ten years he was surgeon at the Boston Floating Hospital.

His interest in urology and the articles written by him on genito-urinary diseases procured his election as a member of the American Urological Association, and he was the editor of vols. II and III of the *American Journal of Urology*, until it changed ownership. Another branch of surgery which claimed his attention was gynecology and obstetrics and of the American Association of Obstetricians and Gynecologists he was chosen a member, and in 1901 was elected vice-president. During the years of his practice in Boston he was a prolific and assiduous writer on medical subjects. His knowledge of French and German, and his ability to read the old classics gave him a large field to draw from. He wrote editorials for the *New York Medical Journal* and *Medical Record*, as well as papers on a great variety of subjects which appeared in other medical journals. These showed his extensive knowledge of ancient and present-day literature of a surprising number of medical topics, but with a strong leaning to medical history. He was a frequent visitor to the Boston Medical Library, and from him was received a large collection of foreign medical theses as well as the exchanges of medical journals with which he was editorially connected. He had a well selected library of medical books, and from time to time many of these found their way to the shelves of the Medical Library. He usually sent reprints of his articles to the Library and in two bound volumes of these there are 92 reprints, catalogued and indexed, in addition to a number which are not included with the bound volumes, all written before 1913. In looking through these 92 reprints I was interested to see the following historical titles: Life of Ambroise Paré, Notes on Geronimo Cardano, Life and Writings of Henry de Mondeville, Literary Notes on Paracelsus, Memoirs of Desault, Theories of Life before the Hippocratic era, The Plague of Athens, Historical Notes on laws re-

*Read before the Boston Medical History Club, January 21, 1929.

lating to civil malpractice in ancient times and the middle ages, Medico-legal aspect and criminal procedure in the poison cases of the 17th Century, Historical resume of tubercular meningitis from Hippocrates to the middle of the 19th Century, Benjamin Franklin from a medical viewpoint, a rather formidable array, which must undoubtedly have entailed many hours of industrious research; of the not historical papers there were 35 on surgical subjects, 12 gynecological and others. The papers themselves were read before societies in Boston, Massachusetts, Maine, New Hampshire and elsewhere and were published in French and German journals as well as American.

After the death of his father, Dr. Cumston decided to return to Geneva which had always had a warm place in his heart, and in 1913 he and his wife left Boston to make their home in Switzerland. After a year spent in travel, chiefly in Italy, they found themselves in Geneva just before the war broke out. From then on he devoted himself to the history of medicine and private practice claimed but little attention, although he continued to write articles on clinical medicine for American and foreign journals. He was a sort of special correspondent, a liaison writer, in that he often sent to American periodicals translations of articles which appeared in French or other foreign medical journals which he thought might otherwise escape notice, and on the other hand he tried to keep foreign journals posted as to what of importance was appearing in American papers. He was also very assiduous in showing to visiting American physicians or others what there was of interest, medically or socially, in Geneva.

Not long after his return to Geneva he was appointed Privat Docent in medical history in the Medical Faculty, to which the words "and philosophy" were later added. This necessitated his giving courses in the Medical School and as a consequence led to his being expected to take an active part in the meetings of the Geneva Medical Society when historical subjects were to be discussed. At a conference in February 1918 he read a noteworthy essay, with illustrations, on Our Sympathetic Confrere François Rabelais; a few months later he presented one on the Sayings and Doings of Maitre Henry David, Lieutenant of the King at Marseilles in the 17th Century. These were published as separate monographs in special paper and bindings. In the *British Journal of Dermatology and Syphilis* for October, 1923 there appeared an important article by him on Syphilis in the 15th and 16th Centuries, especially at Paris; and in 1921 he published in London a work of 350 pages on the Surgical Treatment of Non-malignant affections of the Stomach, with an introduction by Sir Berkeley G. A. Moynihan.

Dr. Cumston was a member of the Royal Academy of Medicine of London, and at one time vice-president of the section on medical history. In the early summer he often went to London where he had many medical friends, and he also enjoyed himself in visiting publishers, libraries and antiquity shops on the search for old books and prints to add to the valuable collection in his apartment in the Rue Bellot, Geneva.

His Magnum opus, published in New York in 1926, was entitled Introduction to the History of Medicine from the time of the Pharaohs to the end of the 18th Century. With an essay on the Relation of History and Philosophy to Medicine, by F. G. Crookshank, a volume of 400 pages, a part of the History of Civilization by Ogden. This received very favorable criticisms in the medical and other papers.

In 1923 Dr. Cumston was elected president of the 5th International Congress of the History of Medicine, which was to be held in Geneva in July, 1925, and on him devolved the task of arranging the program and looking after the details of the meeting. His friends in England were of great assistance to him. The Congress was a noteworthy success and much of the credit for it is due to Dr. Cumston. It was so soon after the war that there were many questions of the policy to be pursued in bringing together members of nations which had so recently been at war with each other. In the end everything went smoothly, and the number and quality of the papers were a great satisfaction to Dr. Cumston. Boston was represented by a paper by the late Dr. J. W. Courtney, a former president of our society. He had a valuable paper on Dr. Benjamin Waterhouse, with a copy of the Stuart portrait of Dr. Waterhouse which hangs in Holmes Hall. This article on Waterhouse was particularly interesting to Dr. Cumston because he had been appointed by the Medical Society of Geneva to represent the Society at the Jenner Centennial in Paris in 1923. Through the kindness of Mrs. Cumston I was given for the Boston Medical Library a unique copy of the Proceedings of the Congress on special paper, made by Kundig, the Geneva publisher, for Dr. Cumston, and I have Mrs. Cumston's card to be placed inside.

An attractive little book was published by him in 1925, A Facsimile with English translation of Pictor's Tract on the treatment of the renal calculus, 1557. Dr. George Pictor was born in the Black Forest in 1550. This is an exceedingly rare tract as it is not mentioned by any bibliographer or biographer of Pictor. The original is in the Strassburg library. Dr. Cumston had a well selected library to which he constantly added, as well as a notable collection of prints of the old leaders in medicine. On the walls of his study in Geneva hung some of the most interesting examples. In the illustrated journal "*L'Esculape*" for 1925 there is a very good picture of him taken when he was president of the Congress in Geneva. It shows him sitting at his table, apparently writing, with

books all about and the walls well covered with his precious prints,

In accordance with what the Genevese called the American spirit of generosity, Dr. Cumston gave a fund by means of which it is possible for the Medical Society of Geneva to call each year some distinguished foreigner to lecture on a subject of medicine in which he is an authority. According to Dr. Cumston's wish, these lectures are called Les Conférences Juillard-Revilliod, in memory of two physicians of the Medical Faculty of Geneva whom Dr. Cumston wished to honor.

Dr. Cumston was a man of medium height, stout, and of very sociable nature. Switzerland had for him a great charm and European life in general he found most congenial. At the beginning of the war I saw him in Geneva, and went with him to the Medical School and library. He was then in apparently good health, but when I next saw him, in 1924, at his home, I found him much thinner and older in appearance, in consequence, as he said, of diabetes. He was dieting and seemed to be holding his own. In 1925 came the Congress in Geneva of which he was president, a position entailing much work and worry. In 1927 his condition was worse and he went to Italy for warmer weather, but returned to a sanitarium above Montreux on Lake Geneva. Pulmonary complications followed, and he died there on April 14, 1928, in his sixtieth year. An article in the *Journal de Genève* of April 17, 1928, gives an account of his career and bears testimony to the high esteem in which he was held by the profession of Geneva.

JOHN W. FARLOW, M.D.

For record and address of author, see "This Week's Issue," page 566.

MENTAL HEALTH CONGRESS

The week of May 5-10, 1930, has been fixed for the convening, at Washington, D. C., of the First International Congress on Mental Hygiene, previously mentioned in the *Bulletins* of June and December, 1928.

The spirit animating International Congress promotion is indicated by the announcement of the acting Committee on Organization that the keynote of the Congress is to be that of "co-öperative participation" of mental hygiene and related organizations in sponsoring, organizing, planning and program making for the Congress.

The International Congress will be sponsored by a Committee on Organization whose membership will be widely representative of the mental hygiene movement in all of the participating countries. The chairman of the Committee is Dr. Arthur H. Ruggles of Providence, R. I., President of the American Foundation for Mental Hygiene and Chairman of the Executive Committee of the National Committee for Mental Hygiene. The Vice-Chairmen of the Committee are Dr. Samuel T. Orton, of New York City, President of the American Psychiatric Association, and Dr. George E. McPherson of Belchertown, Mass., President of the American Association for the Study of the Feebleminded, each of whom serves as Vice-Chairman in his representative capacity, in view of the fact that these associations will join with the International Congress by arranging to hold their annual meetings in Washington during the Congress week.

CO-ÖPERATIVE WORLD-WIDE PARTICIPATION OF RELATED ORGANIZATIONS

Every effort is to be made by the Committee on Organization to make the International Congress a truly *international one* and to secure not only the largest possible attendance from countries other than the United States but the participation in planning and thinking of mental hygiene and related organizations, groups and individuals on a world-wide scale. The plan of organization contemplates the active sponsorship and co-öperative participation of national committees in all the countries interested as part of the Congress procedure. The members of the Committee on Organization from the United States and Canada have volunteered to carry the burden of working out all of the details for the Washington meeting.

Organizations most closely allied to the mental hygiene movement are being asked to designate representatives to serve on the organizing, planning and promoting committees of the Congress. Later on in the procedure, these same organizations, both in the United States and other countries, will be asked to contribute their thought to the organizing of the program of papers and addresses, round table discussions and other features of the Congress program.—*Mental Health Bulletin.*

TEAR GAS USED TO WARN OF DANGER IN FUMIGATION

Tear gas is used in a new fumigation process adopted by the Public Health Service "to serve as a warning agent," according to a statement made public March 4.

In connection with the prevention of the introduction of quarantinable diseases into the United States, the Public Health Service maintains maritime quarantine stations at all the principal seaports in the United States and its possessions through which all ships from foreign ports must pass prior to entering the port. When ships arrive from foreign ports where quarantinable diseases exist, they usually are required to undergo fumigation for the destruction of rodents and insects which might convey infection.

A recent report issued by the Public Health Service deals with the latest experiments made in connection with the use of the poisonous cyanogen products in the fumigation of vessels. This report accentuates the advisability of using cyanogen products which include a sufficient amount of tear gas to serve as a warning agent.

The subject of ship fumigation is one of the greatest sanitary importance. Until a more efficient method for the eradication of potentially plague-infected rodents is devised and its dependability proved beyond a reasonable doubt, fumigation will continue as the procedure of choice.—*U. S. Daily.*

MEDICAL PROGRESS

PROGRESS IN ORTHOPEDIC SURGERY (1928)

BY RALPH K. GHORMLEY, M.D.,* AND EDWIN F. CAVE, M.D.*

THE following summaries represent the important publications during the year 1928 in so far as we have been able to gather them from the literature. All sources have been used to supply the material. Many of the abstracts have been made by ourselves from the original articles. The authors acknowledge the use of some abstracts prepared for the "Progress" reported in the *Archives of Surgery*. We have tried in so far as it is possible to include only those papers which in some way represent an advance in orthopedic surgery. The choice may be questioned by some, but the mass of literature today makes accurate selection in all cases somewhat difficult.

ARTHRITIS

The most interesting group of articles deals with the results obtained from the use of O-iodoxybenzoic acid in arthritis. The widespread use of this drug should have produced by this time some general idea as to its real value. We have here mostly reports from enthusiasts, and it would be well to consider this in the summarizing of their reports.

The first report is that of Young (*N. E. Jour. Med.*, Dec. 13, 1928) who is one of the original advocates of this drug. He presents a series composed of three groups of cases, twenty-five of "arthritis of unknown etiology", twenty treated with O-iodoxybenzoic acid all improving except two who showed new bone formation; five treated with typhoid vaccines showed no improvement at all. A second group of nine cases of gonorrhoeal arthritis treated by the drug showed six cases markedly improved, two improved fairly, and one only slightly. The third group of ten cases of various rheumatic manifestations all showed improvement. The author makes the statement that these three conditions are treated together because of the similarities between them. He then states that these three conditions "all affect the joints in much the same way, the difference being largely in the degree of injury and number of joints involved."

Ed. Note. (The pathologic changes in these three conditions at least in the gonorrheal and the "unknown etiology" group are in no way similar.)

From the other originators of the idea, Youmans (*Annals of Internal Medicine*, Jan. 1928) comes a report of favorable results in three-fourths of eighty cases treated with the drug.

Stein and Taube (*Journ. A. M. A.*, May 19, 1928) report the use of the drug in one hundred and two cases. Of these cases thirty-one claimed temporary relief from pain, but almost every one of them returned later with the same or exaggerated symptoms. They further state that the uniformly poor results caused them to discontinue the use of the drug.

In a more careful analysis of his results Millard Smith (*N. E. Journ. of Med.*, July 19, 1928) points out that some of the failures in the use of the drug may be due to the fact that it increases the permeability of the intestinal mucosa and that those types not benefited are due to absorption of toxins from the intestines.

Cottrell (*Am. Journ. Med. Sciences*, Nov. 1927 and (*Tenn. State Med. Assn. Journ.*, Dec. 1927) reports favorable results in twenty-six cases treated with O-iodoxybenzoic acid.

The same type of favorable results are reported by A. L. Smith (*Nebraska State Med. Journ.*, June, 1928), Jeffrey and Burns (*Northwest Medicine*, Seattle, Dec. 1927) and Service (*Indiana State M. Assn. Journ.*, Jan. 1928).

Manace (*Annals of Internal Medicine*, April 1928) reports a fatality following the intravenous administration of orthoiodoxybenzoic acid.

Stoner (*Journ. A. M. A.*, Aug. 25, 1928) reports unfavorable results from the use of the drug in thirteen cases.

The above reports leave us still somewhat in the dark as to the real value of this drug. Verbal reports and observations of patients have led the authors to regard these highly favorable reports as somewhat colored. We would recommend the report of Millard Smith as a safe guide from which to draw conclusions at present.

Ponndorf (*Münchener medizinische Wochenschrift*, Aug. 24, 1928) reports a long series of cases treated over twelve years with skin inoculations of a lymph prepared from staphylococci and streptococci obtained from the blood of arthritic patients to which are added tuberculin and tubercle-bacillus toxin. Cures were obtained in 48.3 per cent. and improvement in 31.22 per cent. of the cases.

Favorable results from non-specific therapy are reported by Alwens (*Medizinische Klinik*, Berlin, July 6, 1928). On the other hand less satisfactory reports come from Klewitz (*Deutsche Med. Wochenschrift*, Oct. 7, 1927).

Duncan (*Journ. A. M. A.*, Dec. 8, 1928) has described the relationship between hyperthyroidism and joint changes seen in some of these cases. These cases show a rather typical syn-

*For record and adress of author see "This Week's Issue," page 566.

drome of joint pain and swelling and are always relieved by thyroidectomy.

Payr (*Zeitschrift für Klinische Medezin*, Berlin, May 21, 1928) advocates the use of synovectomy in the knee joint in certain types of arthritis. In mild forms of arthritis of the hips he advocates injection with phenol-camphor and relief of weight bearing by an apparatus. In more advanced cases resection must be resorted to.

Fisher (*Journ. B. & J. Surg.*, Jan. 1928) states that in 60% of his cases of type II arthritis amoebae were found in the stools in five examinations. He believes also that amoebae have rarely been demonstrated in areas of focal necrosis of the ends of the bone. These cases have improved with emetin.

The report of Ponnderf is interesting but we are in no way familiar with this. Many cases of arthritis respond to vaccines and nonspecific inoculations. Just what these reactions produce has never been made clear. Until more proof of such treatment is forthcoming we are forced to regard them in that class.

TUBERCULOSIS

Smith and Waters (*Journ. A. M. A.*, Jan. 21, 1928) summarize the results in 208 cases treated by conservative measures. In 22% of these a wrong diagnosis had been made. Of 150 cases followed three years or more 24% died, the majority from tuberculosis; 47% were still active when last examined; and 27% were quiescent with little or no motion and some degree of deformity. Only 21 cases were free from symptoms and had a useful range of motion.

Kidner (*Journ. A. M. A.*, Dec. 15, 1928) assumes that tuberculosis of the hip does not heal without fixation. He therefore argues that operative fixation is the best means of curing this condition. He advocates the extra-articular methods of Kappis and Hibbs, and a method of free transplantation of the trochanter is described.

Sorrell and Longuet (*Revue d'Orthopedie*, Jan. 1928) have studied 20 cases of tuberculosis of the wrist in infants. Their conclusions are based on the fact that the bones of the wrist are largely cartilage in children and therefore avascular and not easily infected with tuberculosis. No cases were under four years of age. In only two of the cases had the disease spread. Eighty per cent. had good healing by conservative methods.

A case of tuberculosis of the subtricipital serous bursa is reported by Torraca (*Riforma Medica*, Naples, April 30, 1928). Clovelin and Sicard (*Presse Medicale*, Paris, Feb. 22, 1928) used calcium chloride intravenously followed by ultra violet radiation. Their results are not definitely stated, though improvement was noted in the majority of the cases.

Morrison (*Lancet*, London, Aug. 18, 1928) found that in about one-third of the cases where guinea pig inoculation had been done no evidence of tuberculosis was found. The relative frequency of Human and Bovine types of bacillus was as follows:

		Bovine	Human
Lymph gland tuberculosis	Children	84%	16%
	Adults	38%	62%
Bone tuberculosis	Children	30%	70%
	Adults	18%	82%

Steindler (*Journ. of the Kansas Medical Society*, Feb. 1928) discusses the problem of drainage of the abscess in spinal tuberculosis. He states that the symptomless abscess should not be interfered with. Drainage is best accomplished by the costo-transversectomy of Menard. Drainage of retroperitoneal abscesses is only indicated when they are secondarily infected. Paraplegia resulting from extension backward into the spinal canal is the most serious type of abscess complication.

Nothing of outstanding importance can be noted in the above reports. Kidner's attitude reflects the general trend of opinion at present in regard to tuberculosis of the hip. The only criticism we have in such an attitude is that there is certainly a selection of cases to be made and a proper time to operate. This has not been clearly brought out. Steindler's observations deserve serious attention. The abscess in Pott's disease is of the greatest importance in prognosing the case.

POLIOMYELITIS

As usual the most important advances in poliomyelitis have been in the epidemiology and immunology of the disease. Little progress can be claimed for the more strictly orthopedic aspects of this problem, but as the orthopedist is fundamentally interested in the epidemiology the following abstracts are included:

Aycock (*Am. Journ. of Hygiene*, Jan. 1928) found in comparing age groups of cases affected by infantile paralysis a marked similarity between poliomyelitis, measles, and diphtheria. This leads him to conclude that poliomyelitis may be widely distributed and by this means many persons may become immunized.

Flexner and Stewart (*N. E. Journ. Med.*, Aug. 2, 1928) after reviewing the experimental work on immunization in poliomyelitis propose that in times of stress and anxiety when poliomyelitis is epidemic, convalescent serum, 10 cc. in children and 20 cc. in adults injected subcutaneously should be used as a prophylactic measure.

Lausten-Thomsen (*Uges Krift for Laiger*, Copenhagen, May 17, 1928) cites instances that indicate that healthy persons may carry poliomyelitis infection for 13-27 years. He advocates stricter regulations for isolation and disinfection.

Aycock and Luther (*Journ. A. M. A.*, Aug.

11, 1928) report their results in 106 cases of poliomyelitis treated in the preparalytic stage with convalescent serum. Using numerical grades for the paralysis and summarizing they found that the average paralysis in the treated cases was 19, whereas in 483 untreated cases the average paralysis was 63.6. The amount and severity of the paralysis varied with the interval elapsing between the onset of the disease and the time of treatment, those patients treated on the first day developing much less paralysis than those treated on subsequent days.

Shaw and Thelander (*Journ. A. M. A.*, June 16, 1928) studied a series of eighty-one cases, forty-three of whom were treated by intramuscular injections of convalescent serum during the "active" stage of the disease. There was a much lower proportion of paralysis in the treated cases than in the untreated ones. They found the incidence of paralysis lower in those cases where the treatment was instituted early.

Rosenow (*Journ. A. M. A.*, Nov. 24, 1928) in a preliminary report describes his technique in isolating gram-positive diplococci of varying size and shape from the sediment of spinal fluid from each of eighteen cases of poliomyelitis in an epidemic occurring near Rochester, Minnesota.

Speed (*Journ. Bone & Joint Surg.*, Vol. X, 1928) reports the results of operative correction for contracture of the hip in 120 cases. The operative procedure was that of Campbell which has previously been described. Of 43 cases showing 30° contracture or less, 41 showed complete recovery; of 47 cases with moderate contracture 42 completely recovered; while of 30 cases with severe contractures 17 recovered completely.

FRACTURES

Osgood and Lund (*N. E. Journ. Med.* 198:61-72, March 1, 1928) review the literature on the subject of fractures of the odontoid process. In addition they report a case in one of the writers.

Wilmoth (*Journ. A. M. A.*, July 7, 1928) calls attention to the fact that "chip" fractures of the lumbar vertebrae and fractures of the transverse processes are often due to sudden extreme muscular action or forced hyperextension. He advocates rest and immobilization. On the other hand, Magnus (*Zenbr. f. Chir.*, 55:22 p. 1354, 1928) claims that the functional result of fractured transverse processes is always good except in those cases where the patients were treated with a plaster bed, long rest and a corset.

Five methods of treating fractured clavicles are offered. The first, by Conwell (*Journ. A. M. A.*, March 17, 1928) is a simple adhesive dressing using four straps of adhesive plaster. The second, by Milroy (*British Med. Journ.*, 1:651-700, April 21, 1928) is a modified Sayre dressing. The third, by Greenwood (*Brit. Med. Journ.*, 1:1009-1054, June 16, 1928) is by means of padded rings over the shoulder held together by straps across the interscapular space. The fourth method by Funston (*Journ. A. M. A.*, Sept. 15, 1928) is by means of a spring back brace with pads carried on crutches under the axillae to the anterior surface of the shoulder joint. A fifth method by Eliason (*Journ. A. M. A.*, Dec. 22, 1928) is not exactly new. He advocates recumbent treatment, saying that ambulatory dressings are generally unsatisfactory as regards comfort. He further points out that so many methods of treatment are offered for fractured clavicle that it simply means that none is entirely satisfactory.

Moore (*Journ. Bone & Joint Surg.*, X, 1928) emphasizes the property of elasticity of the periosteum by demonstrating with beef bone that in fresh tranverse fractures with displacement the periosteum by its elastic pull tends to lock the fragments in a deformed position; but if the fracture is once reduced this elasticity tends to maintain reduction.

Albee (*Journ. Bone & Joint Surg.*, July 1928) in 36 cases of ununited fracture of the femoral neck used the bone peg operation with good results in 90% of the cases. The reconstruction operation in the same type of case gave 75% good results.

Lindsay (*Journ. Bone & Joint Surg.*, July, 1928) advocates in fresh fractures about the elbow very gentle massage for twenty minutes preceding the reduction. The arm is put up in acute flexion and the following day carefully supervised active motion and motion by gravity is started.

Putti (*Chir. d. organi di movimento*, 1927 XI 530) in treating central luxations of the femoral head drives a metal nail 25 cm. long 5 mm. in diameter through the trochanter in line with the femoral neck and perpendicular to the shaft of the femur. Traction is made in the long axis of the femoral neck. When reduction is complete a spica is applied so that traction can be maintained on the nail.

Davidoff (*N. E. Journ. Med.*, 198:61-116, March 1, 1928) has devised a finger splint for fractured phalanges. It is not unlike a miniature Thomas ring splint with screw traction.

Meisenbach (*Journ. A. M. A.*, May 5, 1928) advocates the use of plastic wood as a splinting material for fractures and immobilization of joints.

Adams (*N. E. Journ. Med.*, April 12, 1928) reports a case of autogenous bone graft for fractured carpal scaphoid with a good result. The use of local anaesthesia in reduction of fractures is recommended by Day and Levenson (*N. E. Journ. Med.*, July 12, 1928) and by Rice (*Journ. A. M. A.*, June 2, 1928) particularly adapted to fractures of the lower end of the forearm.

From the experimental work of Fine and Brown (*N. E. Journ. Med.*, June 2, 1928) it is

evident that there is no experimental basis for the presumption that parathormone hastens the healing of fractures in delayed union. Along the same line "Current Comment" (*Journ. A. M. A.*, May 26, 1928) quotes the Council on Pharmacy and Chemistry against the widespread use of this drug.

Knoflach (*Wiener Klin. Wochenschrift*, May 24, 1928) believes that he got an increase in the amount and density of the callus in fifty-one fracture cases treated with irradiated ergosterol.

We feel that the most important thing above noted is the warning against the use of parathormone in ununited fractures. This is obviously a mistaken notion and its use definitely contra indicated.

VASCULAR DISEASES

Allen and Smithwick (*Journ. A. M. A.*, Oct. 20, 1928) review their results in twenty-five cases of peripheral vascular disease treated with intravenous typhoid vaccine. By this treatment they believe that the formation of adequate collateral circulation is hastened and improvement thus gained.

An extensive review of the literature with a thorough discussion and complete bibliography is contained in an article by Painter (*N. E. Journ. Med.*, Sept. 27, 1928).

Morton (*N. E. Journ. Med.*, Sept. 27, 1928) advocates ligature of the vein in the lower extremity when occlusion of the artery exists. His procedure is based on well known surgical facts and his results have justified the conclusion that the procedure has real merit.

The widespread interest in saving the limbs from amputation due to vascular disease is encouraging.

OPERATIONS

Royle (*Journ. of College of Surgeons of Australasia*, 1:1-170, July 1928) advocates transfixion of transplanted tendons by another tendon to make a more stable fixation. Telson (*Surg. Gyn. and Obs.*, 46:303-446, March 1928) transplants the portion of the gluteus maximus having fascial origin together with nerves and blood supply forward along the crest of the ilium to replace a paralyzed gluteus medius. Results are not quoted.

An entirely new suggestion for treatment of Legg's disease comes from Katzenstein (*Zentr. f. Chir.*, 1928, 55:1872) who recommends transplantation of a piece of bone marrow to the head of the femur. He regards the condition as a lack of regeneration of the bone marrow; hence the indication for the operation.

Adson (*Atlantic Med. Journ.*, 31:219-282, Jan. 1928) recommends the use of the anterior approach and tenotomy of the scalenus anticus for the cure of cervical rib. A comprehensive analysis of 303 cases of this condition is included in his article.

Spitzy (*Surg. Gyn. and Obs.*, 46:161-302, Feb. 1928) uses a silk thread passed around the surgical neck of the humerus and knotted, and then passed to the coracoid process to cure habitual dislocation of the shoulder joint. He completes the operation by suturing the redundant capsule over the thread. He has had no recurrences following this operation.

Bunnell (*Journ. Bone & Joint Surg.*, Jan. 1928) by his excellent results demonstrates what can be accomplished in the surgical repair of nerves and tendons in the hand. The operative technique is described in detail. The average time of recovery in nerve repair was twelve months for the finger and fifteen months for the hand and was not influenced by the length of time the nerve had been severed. Procedures for tendon repair were: (1) free tendon grafting, (2) freeing tendons from scar tissue, (3) end to end suture, (4) tendon transference.

Roberts (*Surg. Gyn. & Obs.*, Dec. 1928) reports a new operation for arthrodesis of the hip by means of a tapered block one inch square removed from the superior aspect of the acetabulum. The opening is extended into the head of the femur, the cartilage is removed from the block of bone, and the block is countersunk into the head of the femur. Only one case has been so operated with good result.

Calvé, J. (*Presse Med. Paris*, 1928, XXXVI 695) describes a new approach to the hip joint in which a T shaped incision is used. One portion of the incision runs along the anterior and middle iliac crest while the other portion runs from the mid-point down to and through the trochanter which is split. The two flaps are reflected laterally and a good view of the superior and posterior portions of the joint obtained.

Steindler (*Surg. Gyn. Obs.* XLVII 1928, p. 523) relates the results of 201 stripping operations carried out over fifteen years. He would always use the mesial incision (never the incision around the heel) and strip the periosteum as far forward as the calcaneocuboid joint. He emphasizes the frequent necessity of combining with the stripping operation some wrenching of the foot or a bony operation if the deformity is sufficiently marked.

Albee (*Surg. Gyn. & Obs.* XLVI 1928, p. 845) has successfully enlarged the bony pelvic outlet in two cases. His method is to insert at the symphysis pubic a 1½ inch bone graft removed from the tibia.

Albee's (*Surg. Gyn. Obs.*, Sept. 1928) attitude toward arthroplasty on the knee has changed from one of great conservatism to one of moderate enthusiasm depending upon how carefully cases are selected and with what care the operation is done. He describes in detail his wedge modelling of the joint which prevents lateral instability. Old healed tuberculosis is not necessarily a contra-indication to arthroplasty on the knee. The author's ten cases

operated upon by his method are reported.

Campbell (*Surg. Gyn. Obs.*, July 1928) bases his discussion on the results obtained in 111 cases of arthroplasty of the knee. The functional results have been increasingly better as the number of operations have increased. The indications, contra-indications, technique of the operation and after care of the patient are given. Briefly the operation consists of partial reconstruction of the joint with thorough interposition of fascia between the ends of the bones. In 43 of 111 cases function was restored varying from 35° to 120°. Six unusual cases are reported.

Albee's suggestion so far as we know is an entirely new idea. There should be comment by the obstetricians on this question. Steindler's report bears out the ideas of many others who have found his stripping of the os calcis to be inadequate in the more severe types of pes cavus.

BACK STRAIN, ETC.

The term "myofascitis" is applied by Albee (*Journ. A. M. A.*, Nov. 3, 1928) to a group of cases of low back pain which he calls a clinical entity. This group of cases is unrecognized as such, is treated as "sacro-iliac" strain, and goes from doctor to doctor without relief. The fascial insertions of the muscles are the site of this irritation. Albee says 90% of these cases are due to toxic absorption from the colon, and relief has been obtained by treatment of the colon, medicated lavage, b. coli implantations, and low carbohydrate diet.

Cardis, Walker and Olver (*Brit. Journ. of Surg.*, April 1928) present a comprehensive review of the symptomatology and pathology of Kümmell's disease. Nothing new is contained in this review, however.

"The Neurologic Aspects of Low Back Pain" as presented by Riley (*Journ. A. M. A.*, Feb. 11, 1928) is an important review of symptoms produced by low back conditions. The neurologic syndromes that may be responsible are presented. What is of importance to orthopedists and may be open to question by many is the statement that "sciatica is caused by a multitude of conditions, the great majority of which have absolutely nothing to do with the sciatic nerve. * * * *

The usual etiology for this vast collection of human miseries—the cricks in the neck, the wrynecks, the lumbagos, the sciaticas, the brachial neuritides—is in almost all cases an acute, subacute, or chronic myositis, probably the most prolific cause for pain in the lower part of the back."

It is interesting to read this article in connection with that of Albee. We are not able to accept entirely the above quotation from Riley. Albee's cases seem to be in keeping with clinical findings in some cases. However there is more than a myositis in many cases of low back pain, and the more thorough investigators will agree to this. Solution of the problem of low back pain is not so simple as would be indicated in this article.

INTERNAL DERANGEMENTS OF THE KNEE JOINT

The case of osteochondritis dissecans reported by Wolbach and Allison (*Archives of Surgery* 16:1127-1278, June 1928) is thoroughly studied and is one of the few such cases where the pathology of the bone as well as of the loose body is presented. That the cystic degeneration reported in this case accounts for all these cases is not claimed and probably not true. Paitu and DuBourguet (*Revue de Chirurgie* 65:617-695, 1927) review the literature on this subject and favor Axhausen's embolic theory, also the possible relation to Legg-Perthe's, Köhler's, and Kienbock's diseases. The age, the vague traumatic histories and the epiphyseal nature constitute the similarity.

Henderson (*Journ. A. M. A.*, April 28, 1928) shows the relative frequency of the "bucket handle" type of fracture of the internal semilunar cartilage to be the highest of all. Pfab (*Deutsche Zistr. f. Chir.* V 205, No. 36. 1928) showed the circulation of the semilunar cartilages to be largely in the borders and coming from the synovial membrane.

MISCELLANEOUS

In a review of 420 major amputations Kuhns and Wilson (*Arch. of Surg.*, April 1928) find that drainage is rarely indicated. Either primary closure or if infection exists the wound should be left wide open and sutured secondarily. The Gritti-Stokes results were better than amputations higher in the thigh. Early temporary apparatus for walking is important. Syme amputations gave good results in five of six amputations. Of thirty-four cases of amputation of the upper extremity only six used apparatus.

Seldowitz and Zimtbaum (*Jour. A. M. A.*, May 19, 1928) put forth the theory that Köhler's disease of the tarsal scaphoid is a manifestation of rickets. Their reason for this is that a case was healed in four weeks on antirachitic therapy. Such a theory is unusual but interesting and perhaps true, but must be substantiated with other cases.

A thorough study of the ossification of epiphyseal cartilages in the hand by Hillman (*Am. Journ. of Physical Anthropology*) is of interest to all orthopedists.

Another condition rather frequently met by orthopedic men is meralgia paresthetica. Stookey (*Journ. A. M. A.*, May 26, 1928) describes the condition and shows variations in the location of the external cutaneous nerve. He felt that stretching of the nerve over a sharp angulation at the ilium is the cause of the irritation.

Because it occasionally affects joints, bursae,

and particularly feet, we include an article on Granuloma Coccidioides by Tomlinson and Bancroft (*Journ. A. M. A.*, Sept. 29, 1928). Contrary to the usual end result their case was cured by 1% antimony and potassium tartrate intravenously in doses of 2-8 cc. on alternate days over a period of three months. This was combined with x-ray skin treatment on the foot. The condition is chronic due to coccidioide immitis, a very viable fungus which may live two to five years. It affects particularly the skin and lungs, and most of the cases have at some time been in the San Joaquin valley of California where curiously the disease is located. Eighty-eight cases have been recorded. Out of seventy-three of these cases forty-nine or 60% are known to have died of the disease. The case presented by the authors was in a laboratory worker who had been handling this organism.

Bovie (*Boston M. & S. Journ.*, Feb. 9, 1928) has given us a valuable summary of the comparative efficiency of sources of radiation used in therapy. This is supplemented by a report from the Bureau of Standards of Washington. Here are set down the percentage of transmitted ultraviolet light in the various types of commercial glass.

Along the same line Gonce and Kassowitz (*Jour. A. M. A.*, June 28, 1928) have studied the action of ultraviolet radiation on the bactericidal power of the blood. They found that "normal persons free from any infection are apt to show improved bactericidal properties after continual ultraviolet radiations. Those suffering from chronic infections and post-infectious conditions after daily quartz lamp treatments are apt to show a drop in the bactericidal property of the blood."

Henderson (*Journ. Bone & Joint Surg.*, July 1928) reports seven cases of congenital pseudarthrosis of the tibia five of which were operated upon with only two successful results. End to end approximation of bones, heterogenous and autogenous grafts were used. The last method seems to be the one of choice. He advises against the operation until after puberty, suggesting the use of the walking splint until then.

Donati (*Arch. Ital. di Chir.*, 1927 XVIII 560) reports a number of cases of low dorsal kyphosis. He points out that the low dorsal vertebrae are the last to complete their normal development. This probably is the cause of the maldevelopment in many cases now known as osteochondritis or epiphysitis.

Wade (*Journ. Urology*, 1928 XX 259) believes that the majority of spurs on the os calcis are due to Neisser infection. He recommends surgical removal of well developed spurs.

The authors must take exception to the above statement. There are many cases of spurs on the os calcis not due to Neisser infection, and many may be made comfortable without surgical removal.

SAYS DOCTORS FAIL IN TUBERCULOSIS AID

Addressing the medical students who form the bulk of the audiences at the three day tuberculosis symposium held under the auspices of the Colleges of Physicians and Surgeons at the Medical Center, 168th Street and Broadway and which concluded March 6, Dr. Linsly R. Williams, president of the New York Tuberculosis and Health Association, asserted that the administrative control of tuberculosis can not be accomplished without the active co-öperation of every practicing physician. He propounded the question as to why the percentage of early cases undergoing treatment at hospitals and sanitariums is still low in comparison wih the more advanced cases.

One reason, he said, is that some doctors refuse to diagnose an early case as tuberculosis because of lack of moral courage to tell the patient, because of ignorance or because they do not want to lose a patient.

"Finally," he continued, "the patient goes to a drug store to get something to help him. A district nurse sees him and takes him to a dispensary. The dispensary doctor gets $5 and hour and the County Medical Society goes wild and says, 'That's State Medicine.'"

Dr. Williams also denounced the physician who refuses the Health Department's offer of sanitary supervision in a tuberculosis case because he wants to continue making calls on the patient, and who then neglects the case.

"He makes another call, the patient is low in funds and tells him not to call again unless he is sent for and six weeks later another letter comes from the Health Department asking the physician if he wants to continue supervision of the case. The result is that for more than five months the case has gone with no supervision at all. I've seen it happen often."

Dr. Charles Hendee Smith presented evidence to "refute the statement that tuberculosis is innocuous in childhood." He urged that the slight physical signs of the disease in children need the greatest possible attention given them in making a diagnosis and gave case histories to show that children with the active disease need the rest cure as well as adults.

Dr. Russell A. Hibbs, who spoke on tuberculosis of the joints, said that there has been as yet no proven curative value in heliotherapy, or treatment by sunlight, for this form of the disease. He urged the operative treatment, eliminating mobility in the joints, as the best cure.—*N. H. Times.*

Case Records
of the
Massachusetts General Hospital

ANTE-MORTEM AND POST-MORTEM RECORDS AS USED IN WEEKLY CLINICO-PATHOLOGICAL EXERCISES

EDITED BY R. C. CABOT, M.D.

F. M. PAINTER, A.B., ASSISTANT EDITOR

CASE 15111

ABDOMINAL PAIN IN A SYPHILITIC

MEDICAL AND SURGICAL DEPARTMENTS

First admission. An Italian stage hand fifty-six years old entered October 27 with a diagnosis of nephritis, for observation. His chief complaint was abdominal pain.

He had had the pain almost daily for a year. It occurred most often ten or fifteen minutes after meals, occasionally at other times. More than once it waked him at night. It was always at the sides of his abdomen from the pelvis to the ribs, on the sides of the two recti muscles. Occasionally when it was severe it radiated to both flanks behind and rarely covered the whole abdomen. When it was bad it doubled him up. It was colicky. Food or soda usually gave some relief. He seldom had nausea. Several times during the year he vomited. Two or three times the vomitus was coal black and liquid, not coffee grounds. For about a year his bowels had been constipated and at times his stools had been black. His appetite had been poor; he had eaten only about half as much as usual. His weight had fallen during the year from 165 pounds to 118. During the past three months he had urinated two or three times at night and had had slight difficulty in starting the stream. Recently he had been dyspneic on exertion. He had grown pale. Five months before admission a syphilologist gave him some drops. While he was taking these he felt much better and had less pain.

His wife lost six of eleven children in infancy and had two stillborn.

At eighteen he had a hard chancre and an inguinal gland that broke down. He was treated for several years by a physician. At forty-three he was given a three years' course of treatment in the South Medical Out-Patient Department of this hospital. Three or four Wassermanns were positive. Two of his sons were also treated in the South Medical Department. Both had interstitial keratitis, one had Hutchinsonian teeth and the other symmetrical synovitis. The last of the patient's treatments was six years before admission. For four years he had had indigestion about once a month—gnawing mid-epigastric discomfort coming half an hour after a meal and relieved by soda.

Clinical examination showed a well nourished, pale man. Many carious teeth. Very marked pyorrhea. Musical râles throughout both lungs. Crepitant râles at both bases. Artery walls palpable and tortuous. Blood pressure 120/70. Two scars in the right lower quadrant of the abdomen. A mass, possibly fecal, in the left lower quadrant. Prostate enlarged to about twice the normal size and tender. Right pupil greater than left. Both reacted better to accommodation than to light, the right hardly at all to light. Fundi: discs blurred but normal in color. Vessels showed distinct nicking of veins by arteries. Reflexes normal.

Urine 33 to 70 ounces, specific gravity 1.020 to 1.012, a slight trace to a trace of albumin in all of three specimens. Two-hourly test showed specific gravity 1.008 to 1.012, a large trace of albumin in the day specimen. Renal function 5 to 7 per cent. Non-protein nitrogen 60 to 78 per cent. Blood: hemoglobin 45 per cent, reds 3,080,000 to 2,500,000, slight anisocytosis and poikilocytosis, 11,450 leukocytes, 73 per cent polymorphonuclears, platelets diminished. Wassermann and Hinton tests negative. Gastric analysis: fasting contents, free hydrochloric acid 30, total acidity 40, guaiac negative; test meal, free hydrochloric acid 60, total acidity 80.

X-ray showed nearly complete retention in the stomach at six hours. The prepyloric region was markedly deformed and constricted by an annular filling defect which was constant and through which peristalsis did not travel. The duodenum was filled with difficulty but appeared normal.

A lumbar puncture gave 15 cubic centimeters of clear colorless fluid, initial pressure 80, normal dynamics, cells, 3 lymphocytes, total protein 38, Wassermann, albumin and globulin negative, colloidal gold 1111100000.

Temperature 97° to 100.1°, pulse 71 to 99, respirations normal.

The patient had cramp-like pains on several occasions, usually at night, and vomited several times. Arrangements were made for operation. He decided however to go out and attend to some business before having the operation done. November 3 he was discharged.

History of interval. During his two weeks at home he was very weak and spent most of his time in bed. He had no pain, nausea or vomiting and no tarry stools.

Second admission. November 16 he was readmitted. On entering the ward he vomited a kidney-basinful of greenish fluid.

On clinical examination he was pale and wasted, apparently very weak and acutely ill. Examination was otherwise as before. The hard irregular mass was again present on the left below the umbilicus, the size of an orange, freely movable, not tender.

Before operation urine normal in amount when recorded, specific gravity 1.010 to 1.020, a very slight trace to a slight trace of albumin at

three of four examinations; renal function in two hours 3 per cent; blood, hemoglobin 30 per cent, reds 1,480,000; stool tarry, guaiac very strongly positive; non-protein nitrogen 160 to 110 milligrams.

The patient was comfortable in the ward and had no more vomiting after the day of admission. November 20, on preparation for operation—intravenous glucose 500 cubic centimeters, gastric lavage, morphia and scopolamin—he went into shock. The operation was omitted. The next day he seemed in his usual condition. November 22 500 cubic centimeters of blood was transfused.

November 23 operation was done, followed by another transfusion. He did well during the next week on a gastric régime, had no fluid or distention. He was drowsy and slept a great deal. The urinary output was normal. December 2 the non-protein nitrogen was 78.

Discussion

BY RICHARD C. CABOT, M.D.

NOTES ON THE HISTORY

"Coal black vomitus" is quite a statement. I really think it was something.

Of course syphilitic glands do not break down.

The synovitis and keratitis in his two sons is pretty good proof of congenital syphilis.

The main suggestions up to the beginning of the clinical examination are (a) syphilis and (b) peptic ulcer.

NOTES ON THE PHYSICAL EXAMINATION

The right eye suggests an Argyll-Robertson pupil.

The interval history is striking I think.

DIFFERENTIAL DIAGNOSIS

We suddenly stop because he has not died. What have we got to make a diagnosis on? He has two separate diseases so far as I see. He has chronic nephritis and he certainly has an obstructing gastric lesion which can only be one of two things, either ulcer or cancer. Either is perfectly possible. He is at the age when both are perfectly possible. He has symptoms on the whole more like ulcer. The quantity of blood is more like ulcer. The X-ray picture so far as I know, which is not very far, could do for either. His gastric chemistry is a good deal more like ulcer than cancer. You can have any gastric chemistry in either, but in cancer there is usually a lower acidity than he has. I think that is as far as I can go. On the whole it seems more like ulcer.

A Student: Would you consider chronic nephritis?

Dr. Cabot: There is no relation between the two. It is rather strange that he did not have a high blood pressure. I do not know how to account for it unless it has been higher before but has come down because he is so weakened by hemorrhages.

A Student: What is the likelihood of a carcinoma on top of the ulcer?

Dr. Cabot: Slight, I should say, because that is a rare condition.

A Student: Is loss of weight in favor of ulcer rather than cancer?

Dr. Cabot: Not when he is eating as little as he is.

A Student: Is the appetite affected in ulcer?

Dr. Cabot: No; usually it is good. But ulcer patients sometimes starve themselves, so that one sees emaciated cases of ulcer.

A Student: How about that mass?

Dr. Cabot: I do not know what that is.

A Student: Do you think it is cancer of the stomach? It is just below the umbilicus.

Dr. Cabot: Let us go back to the description. "A mass, possibly fecal, in the left lower quadrant." That is a queer place for the pylorus to be. What does it say the second time? "The hard irregular mass was again present on the left below the umbilicus." That certainly is a peculiar place for the pylorus. I do not believe it. If you ask what it is, I do not know. I think it might be feces.

A Student: Are luetic lesions of this sort in the stomach at all prominent?

Dr. Cabot: The only cases I have seen were very diffuse lesions over the whole stomach wall, not confined to the pylorus. I do not believe there is any such thing as a luetic lesion of the pylorus alone.

A Student: What is the significance of the the enlarged prostate?

Dr. Cabot: It does not seem like a malignant prostate. I suppose it is the ordinary type of prostatic enlargement. Perhaps this does produce obstruction, but we are not told anything about it. Many large prostates do not. If it does we are not at all sure about it. Bladder symptoms are not mentioned.

PRE-OPERATIVE DIAGNOSIS

Carcinoma of the stomach.

OPERATION

Transverse incision. Anesthesia was induced by infiltrating the upper abdominal wall with 50 cubic centimeters of 1 per cent novocain. A transverse rectus incision was then made and anterior splanchnic anesthesia induced by injecting 75 cubic centimeters of ½ per cent novocain against the body of the lumbar vertebra between the aorta and the vena cava. This gave adequate anesthesia to free up part of the greater curvature. There was an indurated mass at the pylorus firmly adherent to the pancreas. The mass showed a definite crater about two centimeters in diameter. The stomach was considerably enlarged. There were no metastases to the liver. The regional nodes were enlarged.

The abdomen was otherwise negative. The anesthesia was insufficient to free the growth at the pylorus, therefore the local novocain was supplemented by ethylene.

The gastrocolic and gastrohepatic omentum were tied off, the stomach was lifted and the tumor was dissected from the substance of the pancreas with some difficulty. This involved dissecting off part of the head of the pancreas. The duodenum was divided and inverted. About half of the stomach was removed and the end sewed and inverted with three layers of continuous catgut. A posterior gastro-enterostomy was then done from left to right and the wound was closed without drainage.

POSTOPERATIVE DIAGNOSIS

Questionable carcinoma of the stomach.

FURTHER DISCUSSION

DR. CABOT: At the beginning of the operation they said carcinoma of the stomach. At the end they said questionable carcinoma of the stomach. With the thing in their hands they could not tell, and I do not see how we can tell.

CLINICAL DIAGNOSIS, FIRST ADMISSION

Carcinoma of the stomach.
Chronic nephritis.
Possible tabes dorsalis.

INTERPRETATION OF X-RAY, SECOND ADMISSION

The findings are those of obstructing carcinoma of the stomach.

POSTOPERATIVE DIAGNOSIS, SECOND ADMISSION

Questionable carcinoma of the stomach.

DR. RICHARD C. CABOT'S DIAGNOSIS

Chronic nephritis.
Gastric disease, probably ulcer, possibly cancer.

PATHOLOGIC DIAGNOSES

Ulcer of the duodenum.
Carcinoma of the duodenum.

DR. TRACY B. MALLORY: A portion of the stomach was resected. It showed a large oval ulcer at the pylorus measuring one by two and a half centimeters surrounding about one-half the pyloric ring and extending both into the duodenum and into the stomach. In the base of the ulcer was a blood vessel of considerable size, an artery, showing a fresh thrombus at the eroded end. The edges of the ulcer were a little suspiciously hard, sufficiently so that Dr. Hartwell definitely committed himself that it was cancer on gross examination. Some of the rest of us who saw the specimen did not feel entirely sure of it.

Microscopic examination however showed a narrow rim of carcinomatous tissue. The situation, the general appearance, the character of the whole thing very strongly suggest that it is a case of cancer developing on ulcer. It is certainly as suggestive of that as any case I have seen.

DR. CABOT: Is there anything to say about this mass in the left lower quadrant?

DR. MALLORY: No, sir. There is nothing to account for it.

DR. CABOT: Everyone was right.

CASE 15112

BLEEDING INTO THE GUMS AND SKIN

MEDICAL DEPARTMENT

An Irish-American post-office clerk forty-four years old entered June 13 complaining of bleeding from the gums and into the skin of four days' duration.

All his life he had had a tendency to bleed profusely from slight trauma. When he was six years old he had profuse spontaneous bleeding from the nose, treated by packing. At twenty-two he had a similar attack. At this time he was in bed for three months. For six months his urine had been reddish brown. Ten days before admission he washed his face in very hot water after shaving. Immediately after this he found that all the acne lesions on his face which he had had for years became bright red and bled. When the bleeding stopped they became black. When he squeezed them very dark colored material came out and they bled again. The following morning he took salts. The resulting stools showed a good deal of bright red blood. Eight days before admission the stool again showed bright blood. He had not noticed this again. The day before admission his gums started to bleed.

There is no history of any familial disease, including blood abnormality. His wife had not been pregnant in seven years of marriage.

His habits were good.

At six years he had purpura hemorrhagica. His nose had to be plugged. His whole right side was paralyzed, he did not remember for how long. His nose always bled easily. After having a tooth extracted during the war he had bleeding for sixteen hours. Three years before admission he had pneumonia lasting three days after he went to a doctor with a temperature of 104°. In February four months before admission, he weighed 175 pounds, his best weight. He now weighed 163 pounds.

Clinical examination showed a well nourished man with mild nosebleed. The skin of the forehead, face, neck, back and chest showed long-standing acneform lesions with a moderate degree of scarring and well marked hemorrhages and scabs. A few lesions were oozing. The skin of the legs and arms showed many small purpuric macules. On the left chest were three

ecchymotic areas about 3 centimeters in diameter. The sclerae were somewhat bloodshot. The gums were soft and showed many small hemorrhages about several teeth. The visible mucous membranes of the mouth and pharynx showed many purpuric spots. The rest of the clinical examination was negative. The blood pressure at admission was 100/70.

Amount of urine not recorded, specific gravity 1.034 to 1.010, no albumin or sugar, 4 to 10 red cells at all of four sediment examinations, occasional leukocytes once. At admission leukocytes 12,350, polymorphonuclears 82 per cent, hemoglobin 75 per cent, reds 5,020,000, normal in size, shape and color, platelets very much reduced. June 13 bleeding still continued after 44 minutes. Clotting time 3 minutes; clot retraction very poor. Hinton negative. Non protein nitrogen 33 milligrams. Stool black. Guaiac very strongly positive at the single examination.

For the first five days the chart was normal. Later readings are given below.

The patient was given quartz lamp treatment daily. June 16 his nose began to bleed quite profusely. A throat consultant put in an anterior pack. Six hours later the patient was bleeding into the pharynx. When the pack was removed blood gushed out. Tighter posterior nasal packs were applied through the mouth and then both nostrils were packed tight from in front. The blood pressure and pulse were good, the blood pressure increasing from 120/80 on the 18th to 140/70 on the 19th. There was no evidence of further bleeding. June 19 the pulse and temperature began to rise, reaching 103° and 120 by night. The ears and neck were normal. There was marked edema of the eyelids, especially the left. With some difficulty the packing was removed and loose anterior plugs were applied. There was very little hemorrhage and the patient felt comfortable. He was kept sitting up with a sling under his knees and ice bags to his head and the back of his neck and was given morphia by mouth and thromboplastin subcutaneously. June 20 600 cubic centimeters of blood was transfused. The blood pressure fell to 93/70. June 21 the hemoglobin was 60 per cent, the red count 3,460,000, the leukocytes 13,900, the polymorphonuclears 83 per cent. There seemed to be many young polymorphonuclears. The platelets were few. A report of an examination of vomitus dated June 22 notes gross blood and strongly positive guaiac. Thromboplastin was again given. The bleeding time was 4 and 5.5 minutes. The temperature rose to 106° rectal and remained elevated, 103° to a terminal 107°. The pulse was 105 to 130, terminal 150. The respirations were 21 to 36, terminal 45. The blood pressure June 23 was 110/70. June 24 the patient died.

Discussion

BY RICHARD C. CABOT, M.D.

NOTES ON THE HISTORY

It looks as if he had a cerebral hemorrhage.

The dark material from these acne lesions was just blood, I suppose.

Bleeding from his nose sounds like purpura hemorrhagica.

His past history is like hemophilia. I do not see how on the evidence of the facts given we can call it anything else. The diagnosis was purpura hemorrhagica, which is quite different from this disease. But the history is more like hemophilia than purpura hemorrhagica. The fact that he has kept his health and has been able to work is a striking thing.

NOTES ON THE PHYSICAL EXAMINATION

Apparently they did not try to count the platelets. They simply made up their minds that they were very much reduced.

DIFFERENTIAL DIAGNOSIS

I should think that we have to suppose two different ailments here, one chronic and one acute. I do not think he showed anemia enough to die from his blood disease. One does not die of purpura hemorrhagica or hemophilia unless the anemia is far greater than it is here. The last count was 3,460,000, plenty to keep him alive. He had a fever and I think an infection at the end of his life. Where the infection is I think we have no clue to guide us. Nothing is said about his lungs. That is nothing characteristic. Nothing is said about his heart in relation to possible acute endocarditis. There may be a local infection about the region where he has been packed or in some place that we do not think of at all. I do not think we can say anything more than that he had an acute terminal infection the site of which is unknown. It is apparent from this statement of the blood findings that he had two things wrong with the blood: (1) a blood whose clot does not retract (purpura hemorrhagica), (2) blood with low platelets. The continuation of the bleeding, the way it went on and on without trauma compels one to say purpura rather than hemophilia. The history is more like hemophilia, but the signs are more like purpura hemorrhagica. So I think we have to say he had purpura with low platelets, and some acute infection of which he died. One of the points against hemophilia is that he has lived as long as this with no lesions in the joints, no blood in the joints producing the hemophilic type of arthritis. It seems to be entirely absent here. I never knew a case of hemophilia to live so long without this symptom. His freedom from it seems to be an important differential point.

A STUDENT: How about the terminal rise in temperature? Could it be due to cerebral hemorrhage?

DR. CABOT: In the absence of any focal brain symptoms we cannot say. It is unwise to suppose a cerebral lesion where there is no muscle disturbance, no loss of muscle control, though the history does seem to show it at an earlier time.

A STUDENT: What about leukocytosis?

DR. CABOT: The leukocytes were very low. The polymorphonuclear count is high.

A STUDENT: What is there in the history that makes you say hemophilia?

DR. CABOT: Because of the number of times he seems to bleed on very slight cause,—again and again during his life.

A STUDENT: Do you not usually get a familial history in hemophilia?

DR. CABOT: You often do not obtain a familial history as you do in textbooks.

A STUDENT: Do you get subcutaneous hemorrhages inside the mouth?

DR. CABOT: I should say not.

A STUDENT: Isn't the blood entirely consistent with purpura hemorrhagica?

DR. CABOT: Yes, perfectly, as we get to the end.

DR. TRACY B. MALLORY: Did the record give anything more about the local condition in the eyes?

MISS PAINTER: No.

DR. CABOT: Edema of the eyelids is something we have not accounted for. It does not come into the history of hemophilia or purpura or anything else that we thought of.

CLINICAL DIAGNOSIS (FROM HOSPITAL RECORD)

Purpura hemorrhagica.
Cavernous sinus thrombosis.

DR. RICHARD C. CABOT'S DIAGNOSIS

Purpura hemorrhagica.
Acute terminal infection.

ANATOMIC DIAGNOSES

1. *Primary disease.*
   Suppurative sphenoidal and ethmoidal sinusitis.
   Suppurative pachymeningitis and leptomeningitis, left cerebral hemisphere.
   Early leptomeningitis of right hemisphere and cerebellum.
2. *Secondary or terminal lesions.*
   Bronchopneumonia.
   Congestion of liver and spleen.

DR. MALLORY: I am sorry that the record seems to be very deficient in several facts which I am sure were known about the patient. The clinical diagnosis was cavernous sinus thrombosis, with which the edema of the eyelids would fit; but of course they must have had more than that to make the diagnosis. He had a very severe suppurative process in both the sphenoidal and ethmoidal sinuses, and moderate meningitis over the left cerebral hemisphere and spreading down over the base of the brain. There was a mild degree of bronchopneumonia. The other organs were all essentially negative. There was no evidence of any old cerebral hemorrhage or scar which might have been attributed to that attack of paralysis in infancy. The spleen did show some areas of hematopoiesis, which is characteristic though not diagnostic of purpura hemorrhagica.

A STUDENT: What did the gastro-intestinal tract show?

DR. MALLORY: There were numerous petechial spots found in the stomach, but nothing further down in the intestinal tract.

DR. CABOT: I do not think we can blame ourselves for missing the site of the terminal infection. Coming back for a moment to what I said about the hemophilia, let us go back to the second paragraph in the case. "All his life he had had a tendency to bleed profusely from slight trauma." That is the clinical description of hemophilia, of course. But as you brought out by several of your questions, he bled later without trauma, and bleeding without trauma we ordinarily speak of as purpura. That first sentence would naturally throw one off.

BOSTON DOCTORS SPEAK BEFORE THE NEW YORK ACADEMY OF MEDICINE

DR. JOSEPH C. AUB, Professor of Medicine at the Harvard Medical School, Boston, will deliver the sixth Harvey Lecture entitled Calcium and Phosphorus Metabolism on Thursday evening, March 21.

Dr. Arthur T. Legg will speak before the Section of Orthopedic Surgery on Friday evening, March 15. His subject is Coxa plana—The Course of the Disease.

Dr. Soma Weiss of the Thorndike Memorial Laboratory, Boston City Hospital, is scheduled to address the Section of Medicine on Tuesday evening, March 19. Dr. Weiss will speak on the Dynamics of the Circulation in Essential Hypertension and Its Bearing on Therapeutics.

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MEDICAL EDUCATIONAL TRUSTS

IN the daily papers there appeared recently accounts of an attack on educational trusts. No authentic report is at hand and the newspaper accounts contain general statements of such a character, combined with such irrelevance or illogicality that perhaps it might be unfair to the speaker to consider them as exactly representative. But it would appear that there was some sort of fulmination against the Carnegie Foundation because of its alleged sinister control of medical education, and against universities in general for their alleged efforts to control graduate education.

Is there a medical trust? Sincerity of conviction as to its existence is not evidence. Only a naïve faith in the power of what one does not know much about, could credit the Carnegie Foundation with control of medical education. But of course to a real democrat the idea of university control of any form of graduate education is abhorrent!

Should such fulminations be taken seriously? Certainly, because they tend to bring to the surface influences which play a very large part in the control of education. For education, and this includes medical education, is controlled very largely by deadening influences at the present time in this country. It is not quite fair to characterize them as sinister, though if the gun is loaded, the victim is just as dead, as if the unintentional killer knew what he was doing. The deadening influence controlling medical education today is the mediocrity of the American people in its intelligence concerning medical affairs. This is the opportunity and occasionally the tragedy for those (relatively few) fine spirits, who not quite blindly, (most of us are blind), try to create something in education which is appropriate for the time in which we live, and has some regard for the future. The past is too much with us, the unintelligent past at least, and even as we boast of our freedom, we are well nigh strangled by the dead hand of that past.

This is an age of science, we say. But how many of us are scientific in our thinking, how many of us use the scientific method in daily life? In health matters the trouble with us is that most of us still believe in magic. Witness the success of patent medicines and quacks and the cults. The laws of science do not quite hold for *us*. We violate them daily and get away with it—now!

Good health is a most precious possession and those in the community whose duty it is to care for the health of others, should have the best natural and acquired equipment. Medicine grows apace and those who practice the art should be those best qualified to acquire and use the science.

There is a plea for "equality of opportunity" for those who wish to practice medicine. It is the basis for a specious argument. "Medical education has been made so expensive by those who control it, that it is restricted to the wealthy. Therefore medical schools should be established which are not expensive, and will give just as good an education as the expensive medical schools give, so that candidates from poor families can study medicine."

But what is an "expensive" school and what an "inexpensive" school? How much difference is there in the student's fees between these groups? Does the student's tuition meet the cost of the education? Does the "inexpensive" school give as good an education as the "expensive"? Is it true that the "poor" boy cannot go to the "expensive school"?

A detailed reply to these questions would take more space than is available now but investigations have shown that "inexpensive" schools, except some state universities, prove in the long run rather expensive for the student.

If one wishes to practice medicine in these United States, it may prove expensive of something besides money, if one finds after graduating that he is not even admitted to examination for licensure in more than one state of the Union. "Equality of opportunity" is a two edged

sword. What of the equality of opportunity for the patients to be restored to health?

There might arise the question of the use of a million dollars for the greatest good in medical education in helping the youth from "poor families". How could it best be used: as a gift to create a new school with only that sum as its endowment? or as a gift for the general endowment of an existing school that now has no endowment? or as a gift to one or more well established and well endowed institutions, the income of the gift or gifts to be used only for free scholarships for indigent but worthy youths (men and women) who not only desire to study medicine but have natural gifts sufficient to enable them to take advantage of the rigorous training and rich opportunities in a first class medical school of university rank? Such a gift for free scholarship does not add to the working capital of the educational institution, for a first class education costs more than the student pays for it, and each free scholarship held is an additional burden on the resources of that institution.

Yes, such fulminations should be taken very seriously, for they help us to realize how little progress science has made in overcoming the forces of obscurantism in education.

NEW BEDFORD'S VENTURE

New Bedford, after three years of study by labor leaders, the Welfare Federation and others, is about to put into effect a community health insurance plan by the establishment of The New Bedford Health Association. Annual dues, amounting to $6 a year for adults and $3 for children under 14, will entitle members to a definite amount of hospital care at a minimum cost to themselves.

Two plans are offered, Plan A permitting members to receive hospital treatment for 30 days in any membership year up to a cost of $4 a day, Plan B entitling members to medical service up to a maximum cost to the association of $200 in any membership year, provided the member pays the first $30 and provided such maximum cost to the association in a case not involving a surgical operation shall be $100.

Three principal objects, it is felt, will be served by the association. 1. Persons of limited means will have a way of assuring themselves of hospital care at a moderate cost. 2. If the plan works as expected, St. Luke's Hospital will have fewer patients to care for below cost and will be able to reduce its deficit and perhaps within a few years to wipe it out. 3. Physicians who now do a large amount of free work in the wards at St. Luke's will be compensated for their services.

The association, which will get under way with a $2,500 underwriting from the Thompson estate, left for charitable work outside the City of Boston, is to carry on for a period of two years, unless its resources become so depleted that the trustees decide to liquidate it earlier. At the end of two years it may be continued for four years at the discretion of the trustees, after which its future will be decided by the Welfare Federation, of which it is a bureau.

The medical profession, as well as the laity, will watch with interest any experiment which has a direct bearing on the cost of medical care, a subject which is receiving much merited interest at the present time. The establishment of the New Bedford Health Association, as *The Evening Standard* of New Bedford notes, marks the beginning of a social experiment which is without a counterpart in this country, and which may lead the way to a solution of the difficult problem of hospital and medical care for persons of moderate means.

THE RELATION OF THE FAMILY DOCTOR AND THE SURGEON SPECIALIST

The advancement of surgery within the last few years has been extraordinary. Operative procedures which a few years ago would have been undertaken with considerable trepidation are now performed unhesitatingly and confidently because of their established low mortality rates. The improvement in mortality rates, particularly in operations of major magnitude, has been accomplished not only by improvement in surgery itself technically, but by better selection of cases, better surgical organization, better anaesthesia and better postoperative care.

Surgeons practicing in large communities have been able to develop for themselves surgical teams whereby they could obtain better anaesthesia, better assisting, and better postoperative care.

So particularly specialized has anaesthesia and postoperative care become, and so numerous are the lives saved by the best application of these two factors in a surgical case that it is the duty of family physicians who have their patient's best interests at heart not to insist that as a part of the operation arrangement they are utilized either as anaesthetist or as assistant. This does not apply to those who are trained and experienced in anaesthesia, assisting, or postoperative care, but to those who, in spite of no or a very limited amount of experience in these departments, either for the small financial return or because of assumed gain in prestige with the patient, insist openly or by suggestion that they participate in the surgical procedure or control the postoperative care.

The surgeon in a large community is able to rid himself of this handicap without difficulty, but many surgeons working in smaller communities and coming into intimate personal contact with patients and consultants are in a much more difficult position. If they refuse to permit family physicians to anaesthetize or assist, that physician's surgery will often be diverted to

another surgeon who will agree to this procedure. It is therefore difficult and almost impossible for surgeons in a small community to break up this vicious circle without jeopardizing their practices and livelihoods. This defect, as has been the general custom in medicine, should be recognized and corrected from within.

Let the family physicians, then, aid those men who have become recognized surgeons in their communities by eliminating this handicap and by helping them to develop better trained and more skillful surgical organizations, thus providing better surgical care for their communities, and eliminating practices which, although in the past countenanced by custom, to-day must be viewed at least with suspicion of being a form of bartering patients.

AN APPEAL FOR FURTHER INFORMATION

Claim is being made by people who are using diathermy, and especially by Harry Eaton Stewart, M.D., of the United States Marine Hospital, New York, after six years' experience, that the mortality of pneumonia has been definitely decreased in cases treated by this agent. It is also claimed that great relief is experienced by the patient after the application of this method.

Since pneumonia is a serious disease contributing materially to the mortality rate, it would seem reasonable to expect that physicians in large hospitals would inform the general public as to the success of this treatment in institutions under their care. If the method has not been employed in hospitals where pneumonia cases are treated in considerable numbers, may it not be reasonable to expect that the hospitals should pay some attention to this form of treatment and report opinions with respect to the use of diathermy.

THIS WEEK'S ISSUE

Contains articles by the following named authors:

Cutler, Max. B.S., M.D. Johns Hopkins University School of Medicine, 1922. Fellow in Cancer Research, Memorial Hospital, New York, N. Y. Assistant in Pathology, Cornell University Medical School. His subject is: "Relation Between Structure and Prognosis in Cervical Carcinoma Under Radiation Treatment." Page 517. Address: 27 West 96th Street, New York City.

Roberts, Douglas J. M.D. University of Vermont College of Medicine, 1916. Associate Roentgenologist, Hartford Hospital. Roentgenologist, Hartford Municipal Hospital and Manchester Memorial Hospital. His subject is: "Practical Points From Pyelography." Page 521. Address: 179 Allyn Street, Hartford, Conn.

Bromer, Ralph S. A.B., M.D. University of Pennsylvania, 1912. Roentgenologist to the Children's Hospital, the Episcopal Hospital and the Orthopedic Hospital. Associate in Radiology, Graduate School of Medicine, University of Pennsylvania. His subject is: "Osteochondritis Luetica: Comparison with Analogous Zones in Rickets and Infantile Scurvy." Page 524. Address: 504 West Mount Airy Avenue., Philadelphia, Pennsylvania.

Kime, Edwin N. A.B., M.D. Indiana University, 1916. Associate in Medicine, Instructor in Applied Anatomy and Physical Therapeutics, Indiana University School of Medicine. Director, Physical Therapeutics, University and Indianapolis City Hospitals. Associate Professor, Physiology, Indiana University School of Dentistry. Professor, Anatomy, Normal College of the N. A. G. U. for Physical Education. President, Western Association for Physical Therapy. Vice-President, American College Physical Therapy. Vice-President, American Electrotherapeutic Association. Member, Research Committee, American Academy of Physiotherapy. Associate Editor, *American Journal Physical Therapy, Archives of Physical Therapy, X-ray and Radium, and Physical Therapeutics.* His subject is: "Electrosurgery." Page 532. Address: 409 Medical Arts Building, Indianapolis, Indiana.

Richardson, Wyman. A.B., M.D. Harvard, 1923. Associate Physician, Massachusetts General Hospital. Physician, Palmer Memorial Hospital. Assistant in Medicine, Harvard Medical School. His subject is: "Pernicious Anaemia. Results of Treatment with Liver or Its Derivatives in 67 Cases." Page 540. Address: 264 Beacon Street, Boston.

Garland, Frederick E. A.B., M.D. Harvard, 1902. Surgeon of Otolaryngology, Massachusetts Eye and Ear Infirmary and Massachusetts General Hospital. Instructor, Laryngology, Harvard Medical School. Address: 483 Beacon Street, Boston. Associated with him is:

Lurie, Moses H. D.M.D., M.D. Harvard, 1917. Clinical Assistant in Otolaryngology, Massachusetts Eye and Ear Infirmary. Assistant Laryngologist, Beth Israel Hospital. Assistant in Otology, Harvard Medical School. Address: 483 Beacon Street, Boston. Their subject is: "Treatment of Chronic Infection of Submaxillary Gland." Page 545.

Farlow, John W. A.B., M.D. Harvard, 1877. Formerly, Clinical Instructor in Laryngology, Harvard Medical School; Surgeon for Diseases of Nose and Throat, Boston City Hospital. Ex-President, American Laryngological Association, the Medical Library Association, and the Boston Medical History Club. Librarian emeritus, Boston Medical Library. His sub-

ject is: "Charles Greene Cumston, M.D." Page 550. Address: 127 Bay State Road, Boston.

GHORMLEY, RALPH K. B.S., M.D. Johns Hopkins, 1918. Assistant Orthopedic Surgeon, Massachusetts General Hospital; Instructor in Orthopedic Surgery, Harvard Medical School. Address: 234 Marlborough Street, Boston. Associated with him is:

CAVE, FOWIN F. A.B., M.D. Harvard, 1924. Assistant on Orthopedic Service, Massachusetts General Hospital. Assistant Orthopedic Surgeon, New England Peabody Home for Crippled Children. Assistant in Orthopedic Surgery, Harvard Graduate School of Medicine. Address: 264 Beacon Street, Boston. They present: "Progress in Orthopedic Surgery (1928)." Page 553.

MISCELLANY

EXECUTIVE COMMITTEE IN CHARGE OF THE GRADUATE COURSE IN CANCER

Dr. Robert B. Greenough, 8 Marlborough Street, Boston.
Dr. Franklin G. Balch, 279 Clarendon Street, Boston.
Dr. Alexander Begg, 80 East Concord Street, Boston.
Dr. George H. Bigelow, Room 546, State House, Boston.
Dr. J. M. Birnie, Springfield, Mass.
Dr. Walter P. Bowers, 126 Mass. Avenue, Boston.
Dr. Walter Burrage, 182 Walnut Street, Boston.
Dr. Ernest M. Daland, 483 Beacon Street, Boston.
Dr. William P. Graves, 198 Commonwealth Avenue.
Dr. Daniel F. Jones, 195 Beacon Street, Boston.
Dr. Mary R. Lakeman, Room 315, 15 Ford Building.
Dr. George A. Leland, 144 Commonwealth Avenue, Boston.
Dr. Fred B. Lund, 527 Beacon Street, Boston.
Dr. Frank R. Ober, 234 Marlborough Street, Boston.
Dr. Stephen Rushmore, 520 Commonwealth Avenue, Boston.
Dr. William M. Shedden, 270 Commonwealth Avenue, Boston.
Dr. Channing C. Simmons, 205 Beacon Street, Boston.
Dr. Irving J. Walker, 520 Commonwealth Avenue, Boston.
Dr. Shields Warren, Palmer Memorial Hospital, Boston.

The Preliminary Program will be published March 21 and the completed program early in April.

MEET ON TUBERCULOSIS

A three-day tuberculosis symposium under the auspices of the College of Physicians and Surgeons opened recently at the college at the Medical Centre, 168th street and Broadway. Lectures were delivered by Dr. Allen K. Krause, associate professor of medicine at Johns Hopkins. More than 200 physicians and medical students attended the meeting.

Papers were read by Dr. Le Roy U. Gardner, director of the Saranac Lake Laboratory, and Drs. Edward P. Eglee, Walter W. Palmer and J. Burns Amberson of the faculty of the College of Physicians and Surgeons.

Dr. Linsly R. Williams, president of the New York Tuberculosis and Health Association, spoke on "Epidemiology and Administrative Control of Tuberculosis."—*New York Times.*

THE DIRECTORY, INC., NEEDS FUNDS

Up to the present time $2951.50 has been received by the Directory Inc. (For Mothers' Milk). The Trustees and Board of Directors are especially anxious to obtain $5000 to help defray expenses and carry on this work.

The Directory furnishes one form of nourishment about which doctors never disagree, namely Mothers' Milk. It is the only food which has never been improved upon and which is still most essential in the welfare of the human race.

To carry on the work of this organization it is necessary to have a force consisting of five individuals who are located at 270 Commonwealth Avenue, Boston. The equipment must be modern and absolutely sanitary as all the milk must be pasteurized in order to safeguard the user beyond any question of doubt.

It is interesting to learn how the institution has grown during the past few years. In January, 1925, three hundred ounces were collected and distributed; in 1926, six thousand ounces; in 1927 eight thousand ounces; and during January 1928, over thirteen thousand ounces. This milk is used at many children's hospitals, also some thirty or forty doctors order this form of nutrition for babies under their care. A great many of these cases are charity patients, for the Directory's aim is not money but service. Donations for this worthy cause may be mailed to Miss Elsie Pollard, Treasurer, 270 Commonwealth Avenue, Boston.

A DANIEL COME TO JUDGMENT

JUDGE PORTER DECLARES DR. SPICKERS WAS JUSTIFIED IN PERFORMING AN OPERATION

Coming to the defense of surgeons who may find it necessary to do extra work which they deem necessary in operating on a patient, Judge Porter yesterday afternoon granted a non-suit in the $25,000 suit of Mrs. Lillian F. Conklin, of Paterson, against Dr. William Spickers, also of this city.

"If I go to the doctor's to have my tonsils taken out the doctor has no right to remove my toenail," Judge Porter said, in commenting on the case. "But if he operates on my toenail and finds gangrene under it he has a right to remove the toe."

"If a doctor cuts open a man for appendicitis," he continued, "and finds the seat of the trouble not the appendix, but something else in that region, it is his duty to remove what is causing the trouble."

"The law implies that the contract between the parties in a case like this is for the surgeon to do everything that is necessary for the welfare of the party on whom he is operating. It is preposterous to expect a surgeon who is operating for a certain disease and finds other trouble to wake the person out of the anesthetic and ask his consent to cut the other part out."

"The human race would not be safe under those conditions," he concluded.

"That may be all right from the doctor's point of view," interposed Lawyer John O. Totten, Jr., counsel for Mrs. Conklin, "but the State must think of the public."

"That's the way I'm looking at it," Judge Porter replied, "and I would rather have the Supreme Court reverse my decision than give a contrary opinion."

About 20 prominent physicians and nurses from the northern part of the State were present in the court room and applauded the decision.

Dr. Spickers operated on George B. Conklin on July 21, 1927, and he died 2 days later. The doctor pointed out that the man was 63 years of age, and attributed his death to postoperative pneumonia. Former Senator P. J. McGinnis and Runyon Colie were counsel for the defendant.

This extract from the *Journal of the Medical Society of New Jersey* is of interest to surgeons. It was first published in a daily newspaper of Paterson, New Jersey.

TRAINING OF PHYSICIANS IN PHYSICAL THERAPY

The American College of Surgeons has made arrangements with the Northwestern University Medical School to include in the Hospital Physical Therapy course a period covering Hospital Economics and other phases of work necessary in the medical direction of a physical therapy department.

This course will start on May 15, 1929, and will continue for thirty days.

The appointment of a physical therapy director for small hospitals is recommended.

Full particulars will be furnished to such as are interested.

A circular letter setting forth the desirability of having a physical director in hospitals has been put out by Dr. Franklin Martin.

WEEKLY HEALTH INDEX

SUMMARY

Telegraphic returns from 65 cities with a total population of thirty million for the week ending Mar. 2, indicate a mortality rate of 15.8 as against 14.5 for the corresponding week of last year. The highest rate (32.2) appears for Nashville, Tenn., and the lowest (8.6) for Yonkers, N. Y. The highest infant mortality rate (182) appears for Spokane, Wash., and the lowest for Duluth, Minn., Knoxville, Tenn., and San Diego, Calif., which reported no infant mortality.

The annual rate for 65 cities is 17.2 for the nine weeks of 1929, as against a rate of 13.8 for the corresponding weeks of 1928.—*U. S. P. H. Service.*

DELTA OMEGA LECTURE AT YALE

Dr. James A. Doull of the Johns Hopkins School of Hygiene and Public Health delivered the first Delta Omega Lecture at the Yale School of Medicine on March 8, 1929, under the auspices of the Epsilon Chapter of the Society. The subject of Dr. Doull, who represented the Alpha Chapter of Delta Omega, was "Factors in the Selectivity of Diphtheria and Scarlet Fever". Professor C.-E. A. Winslow presided at the meeting, which had a large attendance from the medical school and from the public health department.

Certificates and keys of Delta Omega, which is the honorary public health society, were awarded by Dr. James A. Tobey of New York, national secretary of the Society, to Dr. James E. Rush and Mr. F. W. Fabian, newly elected members, at a dinner preceding the lecture by Dr. Doull.

The second Delta Omega Lecture of the Gamma Chapter of the Massachusetts Institute of Technology is to be given at the Institute at 4 P. M. on Friday, April 12, 1929, by Dr. George T. Palmer, who is to speak on the School Health Study of the American Child Health Association, of which he is Director of Research. Dr. Palmer represents the Delta Chapter of the University of Michigan.

PSYCHIATRISTS AND LAWYERS

The report of the Carnegie Foundation's survey of "Present-Day Law Schools in the United States and Canada," furnishes another answer to the question "what is wrong with the law?", so frequently asked in connection with America's crime problem. Reference is made to the fact that legal education as organized in the United States has "ceased to correspond to the facts of professional life," a situation characterized by Alfred Zantzinger Reed, who directed the study, as the present system's most fundamental weakness. He points out, by way of contrast, that while medicine, dentistry, nursing, etc., are separately organized, "the theory of the law is that all lawyers are trained to become members of a single individual profession" even though "the activities in which individual lawyers engage differ from one another quite as markedly as do the various branches of the healing arts."

Recognizing this, crime commissions, judges, legislators and various citizen groups concerned over the breakdown of American justice have taken steps that it is hoped will effectually correct the insanity plea evil. The National Crime Commission dealt with the situation in a special report last spring in connection with the malodorous Remus case in which legislation modeled on the Massachusetts and Colorado laws and approved by leading American jurists was recommended as a reform measure. California, New York, New Jersey, Pennsylvania and other states are now engaged in concrete efforts to cope with the problem, one after another of them drawing up plans for the handling of insanity pleas that they hope will work.—*Mental Hygiene Bulletin.*

BIZARRE REMEDIES

A man posing as a physician was arrested in England recently. On being examined he described "ad valorem" as a drug. The Manchester *Guardian* thinks it might not be without some benefit in that respect. "One tablespoonful of ad valorem taken every four hours might have worked wonders with many a simple patient, and there is no knowing what an infusion of vice versa in medias res might have done for some people. Equal parts of verb. sap., compos mentis and sine die, well beaten up with esprit de corps, suggests another safe household remedy."—*Word Study.*

CONNECTICUT STATE DEPARTMENT OF HEALTH

COMPARISON OF DISEASE INCIDENCE IN CONNECTICUT WITH 1928 AND SEVEN YEAR AVERAGE MONTH ENDING FEBRUARY 16

DISEASES	1929					1928			
	Wk. ending Jan. 26	Wk. ending Feb. 2	Wk. ending Feb. 9	Wk. ending Feb. 16	Average cases reported for week corresponding to Feb. 16 for past seven years	Wk. ending Jan. 28	Wk. ending Feb. 4	Wk. ending Feb. 11	Wk. ending Feb. 18
Actinomycosis	-	-	-	-	-	-	-	-	-
Anthrax	-	-	-	-	-	-	-	-	-
Botulism	-	-	-	-	-	-	-	-	-
Cerebrospinal Men.	2	3	2	2	-	-	1	1	-
Chickenpox	114	74	69	98	80	105	130	123	75
Conjunctivitis	-	-	-	-	-	-	-	-	-
Diphtheria	35	28	27	30	43	46	42	43	29
Dysentery Amoebic	-	-	-	-	-	-	-	-	-
Dysentery Bacillary	-	-	-	-	-	-	-	-	-
Encephalitis Epid.	-	-	1	-	2	1	2	-	-
Favus	-	-	-	-	-	-	-	2	2
German Measles	43	35	55	72	20	6	3	4	1
Hookworm Infection	-	-	-	-	-	-	-	-	-
Influenza	3119	684	656	373	225	7	11	3	10
Leprosy	-	-	-	-	-	-	-	-	-
Malaria	-	-	-	-	-	1	-	-	-
Measles	324	253	374	328	233	164	265	280	318
Mumps	82	83	77	91	49	95	78	114	102
Paratyphoid Fever	-	-	-	-	-	-	1	-	2
Pneumonia (Broncho)*	129	110	81	73	38	27	33	29	30
Pneumonia (Lobar)	130	119	96	69	54	58	37	50	74
Poliomyelitis	-	-	1	-	-	1	2	-	-
Scarlet Fever	65	37	43	65	114	124	85	114	86
Septic Sore Throat	1	3	3	-	2	4	1	1	2
Smallpox	-	-	-	-	3	15	6	6	1
Tetanus	-	-	-	-	-	1	-	-	-
Trachoma	-	-	-	-	-	-	-	-	-
Trichinosis	9	-	-	-	-	-	-	-	-
Tuberculosis (Pul.)	37	22	16	26	26	63	22	47	26
Tuberculosis (O.F.)	2	1	2	3	2	7	6	1	2
Typhoid Fever	-	-	-	-	2	1	-	2	1
Tularemia**	-	-	-	-	-	-	-	-	-
Typhus Fever	-	-	-	-	-	-	-	-	-
Undulant Fever**	-	-	-	-	-	-	-	-	-
Whooping Cough	36	28	17	18	55	125	155	190	96
Gonorrhoea	22	38	46	14	14	37	38	25	28
Syphilis	39	43	37	28	15	75	42	33	29

* Made reportable January 1, 1925
** Made reportable July 1, 1928

REMARKS: No cases of Asiatic cholera, glanders, plague, rabies in humans and yellow fever during the past seven years.

CRIME COMMISSION ADVOCATES MENTAL CLINICS

The establishment of mental clinics in the school systems of the state and the substitution of trained social workers for the "old-fashioned truant officer" are recommendations made by the New York State Crime Commission after a study just completed by the Sub-Commission on Causes and Effects of Crime. The report states that there is no "unit cause" for crime and that "while no panacea will ever be found to solve the crime problem," there is hope in a careful study of the present methods of dealing with crime and criminals.

The Commission also recommends that the educational authorities should seriously consider giving "dull normal" or sub-normal children courses of study adapted to their mental capacities, as well as vocational guidance and assistance in finding suitable work. A paramount requirement, the report states, is the employment of "constructive personalities who have the specialized training and skill necessary for work with offenders." What is needed is "not only a knowledge of legal procedure but an appreciation and understanding of the motives underlying human behavior."—*Mental Hygiene Bulletin.*

THE SPIRIT OF SERVICE

which dominates the activities of the American Pharmaceutical Manufacturers' Association is best exemplified in the following code of ethics to which its members are pledged:

A Declaration of Belief

I.

We believe that the pharmaceutical manufacturer should ever be mindful of and guided by the fundamental principle that his business is a solemn calling and a glorious profession dedicated to a great and paramount public service.

II.

We believe that the pharmaceutical manufacturer should always be animated by a true spirit of justice, amity, responsibility and service in all his dealings with others and unswervingly act at all times in pursuance of the elementary conception of right, honorable and ethical business conduct as befitting his membership in a society built upon the sure foundation of a democracy, organized in harmony with the most enlightened civilization in history, inspired by the teachings of our Divine Master, and finally directed equally to preserve the opportunity and rights of each for the benefit of all to enhance the general happiness and welfare.

III.

Hence we believe that it is the unquestioned obligation of each and every pharmaceutical manufacturer:

(a) To manufacture medical preparations only under proper conditions and of established value, pure and accurate in composition, and true upon and to their label.

(b) To label, advertise and merchandise such preparations only in a manner wholly free from misrepresentation of any kind, in complete accord with both the spirit and terms of the applicable laws, and in entire harmony with the highest standard of commercial morality and ethics:

(c) To refrain from in any way or to any extent infringing upon the equal rights (whether moral or legal) of a competitor and unfairly interfering with his business, as by uttering false or disparaging statements about him or his products or his business, by misappropriating his trade names or formulae or the distinctive form or dress of his products, or by enticing away his employees.

(d) In short, constantly, earnestly and conscientiously to strive at all times and in all ways to advance the science and to elevate the profession of manufacturing pharmacy to the highest and idealistic plane of public value to the end that it may best and most completely serve the medical profession and the public at large.

IV.

This Do We Believe

CONSULTATION SHOULD DECIDE THE TREATMENT OF CANCER

Twenty-five years ago the treatment of cancer consisted exclusively of surgical removal, but today the decision as to the treatment is a complex question of choice between various methods, owing to the introduction of radiation therapy. There are now rather definite indications calling for surgery in one case, radiation in another, and often for combinations of both methods. The great value of radiation as a palliative agent in advanced cases has led to a narrowing of the scope of operability. The decision as to the best method of treatment calls for consultation between experts in several different fields, and may not safely be entrusted to any one who is familiar with only a single method. These problems confront the specialists in all different fields of medicine, since cancer presents different problems in each of the organs.—*Bulletin Am. Soc. for the Control of Cancer.*

TUBERCULOSIS SEALS BRING IN $52,000

Dr. Edward O. Otis, chairman of the Christmas seal sale committee of the Boston Tuberculosis Association, reports that that the sale has brought in $52,000 to date.

There are many seals outstanding, and there is still time for the holders of these seals to make returns either in money or seals so that the files of the association may be cleared.

Last year the total amount from the Christmas seal sale was $54,700. Dr. Otis believes that by the time the Christmas seal sale returns are complete, which will be about April 1, the returns will be at least as much as last year.—*New York Times.*

SAYS MEDICINE STILL IS NECESSARY

"Humanity is not yet ready for the complete acceptance of healing by faith, and for the time being must accept the aid of the medical profession," Mrs Annie C. Bill of London, leader of a Christian Science group, said February 25 at a service in the McAlpin. The movement she is leading in England and America holds that faith should supplement rather than supplant medical care in healing. "By faith," she said, "patients will become less and less dependent on doctors. That is the great advance which has been made by the Christian Science Parent Church."—*New York Times.*

CORRESPONDENCE

CLINICAL MEETING FOR THE BOSTON SURGICAL SOCIETY—NEW ENGLAND DEACONESS HOSPITAL

March 4, 1929.

NEW ENGLAND JOURNAL OF MEDICINE:

Enclosed is program which was carried out at the New England Deaconess Association Hospitals March 4, 1929.

The clinics were well attended at both the Deaconess and Palmer hospitals.

CAROLINE A. JACKSON, *Superintendent.*

March 4, 1929

NEW ENGLAND DEACONESS HOSPITAL

OPERATIONS

Room 1.

8:00 Dr. Lahey, Exophthalmic goiter, Thyroidectomy.
8:45 Dr. Lahey, Exophthalmic goiter, Thyroidectomy.
9:15 Dr. Lahey, Gall Stones, Cholecystectomy, Spinal Anesthesia.
10:15 Dr. Mason, Adenoma thyroid, Excision.
10:45 Dr. Lahey, Thyrocardiac, Thyroidectomy.
11:30 Dr. Cattell, Adenoma Thyroid, Excision.
12:00 Dr. Lahey, Gall Stones, Cholecystectomy, Spinal Anesthesia.

Room 11.

8:00 Dr. McKittrick, Gall Stones, Diabetes, Cholecystectomy.

Room 111.

8:30 Dr. Clute, Exophthalmic goiter, Thyroidectomy.
9:15 Dr. Cattell, Exophthalmic goiter, Thyroidectomy.
10:00 Dr. Clute, Gall Stones, Cholecystectomy—Spinal Anesthesia.
11:00 Dr. Mason, Adenoma Thyroid, Excision.
11:45 Dr. Clute, Adenoma Thyroid, Excision.

DRY CLINIC

Second Floor, 11:15 A. M.

Drs. D. F. Jones, E. P. Joslin and L. S. McKittrick.

Ward Demonstrations of Surgical Complications of diabetes.

Operating Floor—Between Operations.

Treatment of Gastric Ulcer, Dr. S. M. Jordan.

Cystoscopy in Uterine Prolapse, Dr. J. B. Hicks.

End Results in Gall Bladder Surgery, Dr. R. B. Cattell.

Spinal Anesthesia, Dr. L. F. Sise.

Cardiac Conditions in General Surgery, Dr. L. M. Hurxthal.

PALMER MEMORIAL HOSPITAL

8:45 Dr. G. A. Leland, Jr., Electro-coagulation of carcinoma of the buccal mucosa, Local anesthesia.
9:00 Dr. D. F. Jones, Combined abdominal and perineal operation for carcinoma of the rectum, Spinal Anesthesia.
9:30 Dr. G. G. Smith, Nephrectomy for pyonephrosis, secondary to carcinoma of the bladder. Ether anesthesia.
10:45 Dr. G. G. Smith, Amputation of penis for melano-carcinoma. Local anesthesia.

SUGGESTIONS FOR SMALL TOWNS WHICH SEEK DOCTORS

February 28, 1929.

Editor,
NEW ENGLAND JOURNAL OF MEDICINE:

Dear Sir:

In the discussion on the decreasing supply of general practitioners for rural Vermont, detailed in your issue of November 29, 1928, I note a lack of concrete suggestions for the remedying of the situation.

I make the following suggestion:

Let any small community desiring to secure a physician certify to the State Medical Society that a sum has been deposited by it sufficient to supply the rent of a physician's office for one year together with a supply of office equipment such as meets the approval of the State Society including an x-ray outfit and present this as an inducement for new graduates to locate, the outfit to be rented for one dollar a year to the physician of the community's choice.

It seems to me that the remedies hitherto proposed have been either entirely inadequate or altogether too ambitious. What have those about to graduate to suggest?

Yours truly,

H. B. AITKENS.

HOW MAY QUESTIONS BY THE LAITY BE ANSWERED

The Commonwealth of Massachusetts
Department of
Public Health
State House, Boston, March 5, 1929.

To the Editor,
NEW ENGLAND JOURNAL OF MEDICINE,

Dear Sir:

We are faced with a dilemma. On one hand, it is contrary to the policy of the Department to give out the names of private practitioners to persons desiring advice as to whom they should consult privately. This, of course, is a matter which is embarrassing to many individuals and organizations today, including the medical profession. When pushed, we usually resort to the somewhat conventional advice of consulting any of the reputable hospitals in the community for a list of their staff.

On the other hand, we are receiving in increasing numbers requests for the names of physicians in various communities over the State who are prepared to treat syphilis and gonorrhea, and our responsibility to the public health demands that we give some advice which would carry some guarantee of adequate treatment of these cases. We find that many physicians object to treating this type of case altogether. Others will handle it out of a sense of duty when they meet it in the course of their general family practice. Others treat it because they find it lucrative, and others give this treatment because they are sincerely interested in the disease and give a high quality of service. This last group are more readily found in the larger than in the smaller communities. It is contrary to the policy of the Department to advise persons able to pay for service privately to go to clinics and many

of the communities from which we get requests have no clinic service even if we were willing to advise that they go to them.

In some states the local medical societies have determined on an individual in each community who after special training in the treatment of these diseases is recognized as a specialist in this field and such cases are sent to him. In such a situation the selection is in the hands of the medical profession, where it belongs. Such efforts as I have made to meet with local medical societies to discuss this matter of organizing clinics where they do not exist or selecting an individual to whom these patients might be referred has met with a colossal indifference. In some places we are shocked to find the argument that these diseases are merely the result of lack of self control and the individual suffering from them deserves as little consideration as he gets.

Frankly, we are at a loss to know which way to turn. On the one hand, sound policy indicates that we should not give out the names of individual physicians, and on the other hand our responsibility to the public health urges us after due consideration to give out such names. Is there not someone in the profession willing to face this problem with us and give some suggestion as to which solution?

Yours truly,

GEORGE H. BIGELOW, M.D.,
Commissioner of Public Health

NEWS ITEMS

DR. PHANEUF READS PAPER BEFORE THE N. Y. ACADEMY OF MEDICINE — Dr. Louis E. Phaneuf read a paper on Uterine Prolapse before the Section of Gynecology and Obstetrics of the New York Academy of Medicine on Tuesday evening, February 26th, 1929, and held an operative clinic at the New York Post-Graduate Medical School and Hospital on Wednesday morning, February 27th, 1929.

A QUESTION OF AUTHORITY—The newspapers report the removal of Dr. Thomas B. Rafferty of Lynn from the position of School Physician of that city by the City Health Commissioner. Dr. Rafferty contends that the Health Commissioner has exceeded his authority in the matter.

The details with respect to this action have not been published.

RECENT DEATHS

STEVENS—Funeral services for DR. RUEY B. STEVENS, widow of Dr. Seriah Stevens, were held at 2 P. M. March 10 at her home, 942 South Street, Roslindale. She died at her home March 8.

She was educated at Robinson Academy, Exeter, N. H., and later received a doctor's degree from Tufts Medical School. She began practice in Roslindale but abandoned her professional life when she married Dr. Seriah Stevens 35 years ago.

She is survived by a sister, Miss Ada S. Bartlett of Watertown, and a niece, Mrs. Ethel M. Pike of Sanbornville, N. H.

KEEFE—DR. DANIEL E. KEEFE, 78, long a prominent physician in Springfield, one of the founders and the president of Mercy Hospital, whose staff he headed for 23 years, died March 9. He was an authority on anesthesia and a prolific writer on medical subjects and was much sought as a consultant. Though he retired four years ago he remained active in the pursuit of medical science. He had lived in Springfield 50 years.

PERKINS—DR. HAMILTON C. PERKINS of 556 Broadway, South Boston, died March 3, 1929 after a brief illness, in his 41st year. He was born in Madbury, N. H., attended public schools at Dover, N. H., and was graduated from Tufts medical school in 1910. Practically ever since he had practiced medicine in South Boston.

He was a Mason and a member of the South Boston Medical Society, the South Boston Yacht Club and Michael J. Perkins Post, American Legion, of South Boston. He is survived by his widow and two children.

NOTICES

REMOVAL

Dr. Frank E. Stowell announces the removal of his office to the Central Building, 332 Main Street, Rooms 518-519, Worcester, Massachusetts.

J. H. Swartz, M.D., announces the removal of his offices from 536 Commonwealth Ave., 636 Beacon Street, to the Holmes Medical Building, 471 Commonwealth Avenue, at Kenmore Station, Boston, Massachusetts.

UNITED STATES PUBLIC HEALTH SERVICE

Change of Duty and Station of Commissioned Officer of the United States Public Health Service in New England.

Dr. William Duane, of the U. S. P. H. has been directed to proceed from Boston, Mass., to Washington, D. C. and return, about February 25, in connection with field investigations of industrial hygiene. Feb. 20, 1929.

REPORTS AND NOTICES OF MEETINGS

BOSTON HEALTH LEAGUE

The annual meeting of the Boston Health League was held March 4, 1929. The principal address "Health Education" was delivered by Dr. Thomas D. Wood and will appear in a later issue.

His Honor, Mayor Nichols, spoke of the work of the League in a most gracious and encouraging address.

The following-named officers were elected:

Honorary President, Francis X. Mahoney, M.D.
President, John W. Bartol, M.D.
Vice President, Rev. George P. O'Conor.
Treasurer, Richard G. Wadsworth, M.D.
Secretary, Charles F. Wilinsky, M.D.

Executive Committee, George C. Shattuck, M.D., Miss Ida M. Cannon, John A. Ceconi, M.D., Roy M. Cushman, John B. Hawes, 2d, M.D., Horace Morison, Miss Florence Patterson, Stephen Rushmore, M.D., Clarence L. Scamman, M.D., Richard M. Smith, M.D., Frank E. Wing.

About eighty partook of the banquet and over four hundred people interested in public health and social work convened to hear Dr. Wood's address.

In a letter recently received by the League, Dr Wood expressed his admiration for the work which Dr. Ceconi is doing in the Department of School Hygiene particularly concerning the program of instruction in health education for teachers in service.

MASSACHUSETTS PSYCHIATRIC SOCIETY

THE MASSACHUSETTS DISTRICT OF THE AMERICAN PSYCHIATRIC ASSOCIATION

A meeting of the Massachusetts Psychiatric Society was held at the Boston Psychopathic Hospital February 27, 1929. In the absence of the President, Dr. Thom, Dr. L. Vernon Briggs, the Vice-President, presided.

Preceding the scientific session, resolutions on the tragic death of Dr. Ransom H. Sartwell, a member of the Society, were adopted.

Dorothy Swain Thomas, Ph.D., Assistant Professor of Education at Teachers' College, Columbia University, New York, and a member of the staff of the Institute of Child Welfare Research of that city, presented a paper entitled "Some New Techniques for Studying Social Behavior." She described in considerable detail, assisted by diagrammatic sketches, the method of observing objectively the social behavior of twenty children in a nursery school in New York City. An attempt has been made to make the recorded observations as objective as possible, but it has been interesting to know that even in a matter which appears so simple as recording the social contacts, spacial, physical and verbal of young children, the reliability of observers has been found to be higher for the recording of time than for the naming of the activity. Dr. Thomas pointed out that in the recording of data, it is highly important for the observer to make sure he is observing accurately.

The paper was discussed by Dr. Healy and Dr. Doering.

Dr. C. Macfie Campbell then gave a brief description of the research project under way at the Boston Psychopathic Hospital under the title of "The Study of Environmental Factors in the Schizophrenic Group." The difficulties in a study of a problem like that of schizophrenia are much more complicated than those in the observation of the social behavior of young children. Dr. Campbell showed how the reliability of the informants from whom data are collected varies very considerably. Added to the difficulties of obtaining past history is the complication that the exact significance of the term schizophrenia is uncertain. The work now under way has shown the importance of putting the clinical material into as accurate form as the records allowed and has served to stimulate the current clinical work by making it more precise and pointed. Whatever additional results may be obtained by the application of statistical method to the data, it is certain that the preparation of the material has had a very great value for the staff. Dr. Campbell's paper was discussed by Drs. Briggs, Doering, Bryan and May.

Following the scientific session, a collation was served to about one hundred guests and members.

WINFRED OVERHOLSER, *Secretary.*

WACHUSETT MEDICAL IMPROVEMENT SOCIETY

The regular monthly meeting of the Wachusett Medical Improvement Society was held at the Holden District Hospital, Holden, Mass., Wednesday, March 6, 1929, with twelve members and one visitor present.

The Secretary read a letter from Dr. Donald S. Adams in which he tendered his resignation from the Wachusett Medical Improvement Society, giving as his reason that he is unable to attend the meetings.

Dr. Theodore L. Story, the speaker of the evening, talked of the experiences of an industrial physician. In the immense plant in which he works Dr. Story is dealing with all nationalities (fourteen are represented) and with all classes of society; thirty-seven college graduates are at present in the employ of this company. Dr. Story is trying to obtain a compulsory thorough examination for all prospective employees because he believes that routine examinations would save his firm considerable money; inasmuch as in his opinion many compensations are claimed for preëxisting conditions.

The industrial physician comes in contact with all kinds of cases as demonstrated in Doctor Story's review of the various conditions that have come under his observation.

Many questions were asked by the different members and much discussion took place.

The meeting adjourned at 11 P. M.

PAUL DUFAULT, M.D.,
Secretary-Treasurer.

HARVARD MEDICAL SOCIETY

There will be a special meeting of the Harvard Medical Society at 8:15 on the evening of March 15 in the Peter Bent Brigham Amphitheatre. Program:

1. Presentation of Cases.
2. Some more Experiments on the Function of the Kidney.

A. N. Richards, M.D., Department of Pharmacology, University of Pennsylvania, (Philadelphia).

W. P. MURPHY, M.D., *Secretary.*

NEW ENGLAND HOSPITAL FOR WOMEN AND CHILDREN

The clinical conference of the New England Hospital for Women and Children will be held at the hospital, Dimock Street, Roxbury, on Thursday, March 21, at 8 p. m.

The February program, necessarily postponed, will be given, as follows:

Glaucoma; Dr. Maud Carvill.

The Medical Management of Some Gastro-intestinal Conditions; Dr. Sarah M. Jordan.

A Pediatric Subject; Speaker and Topic to be Announced.

ALICE H. BIGELOW, *Secretary.*

THE ANNUAL SESSION OF THE AMERICAN COLLEGE OF PHYSICIANS

The American College of Physicians will hold its Thirteenth Annual Clinical Session in Boston, April 8-12. Dr. Charles F. Martin, Dean of the Faculty of Medicine, McGill University, is President of the College this year, and Dr. John H. Musser, Professor of Medicine at Tulane University Medical School is President-Elect and will be inducted to the Presi-

dency toward the end of the Boston meeting. Dr. James H. Means, Jackson Professor of Clinical Medicine at Harvard Medical School and Chief of the Medical Service at the Massachusetts General Hospital is General Chairman of all Boston Committees having charge of arrangements for the Clinical Session of the College in April.

The program provides hospital visits, clinics, demonstrations and ward-walks during the forenoons at fifteen different Boston hospitals, and for general scientific sessions each afternoon and evening in the Assembly Room of the Hotel Statler, which will be headquarters. Eminent authorities in their special lines will present the results of their work before an audience competent to appreciate the value of the contributions.

A Symposium on Deficiencies will take place the first evening of the Session, and will be of particular interest because of the fact that deficiencies are nowadays assuming a far more wide-spread and important rôle than had heretofore been anticipated. They have come into their own as factors producing acute and chronic disease on a par perhaps with infections. The Committee has secured for the Program men who can speak with authority on a variety of aspects of this important subject.

Another special feature is a review of the present Status of Vaccine and Serum Prophylaxis and Therapy, designed to give the Internist a rapid survey of the field. The speaker, Dr. Benjamin White, of Boston, is an authority on these subjects and can give the high spots in rapid and yet forceful fashion.

The annual Banquet of the College will be held Thursday evening, April 11, when Dr. George E. Vincent, President of the Rockefeller Foundation, will deliver the chief address. The Convocation, for the conferring of Fellowships, will take place Friday evening, April 12. Dr. Charles F. Martin, of Montreal, will deliver the Presidential Address.

Programs and details concerning reduced fares, admission, etc., may be secured from the Executive Secretary, E. R. Loveland, 133-135 S. 36th Street, Philadelphia, Pa.

Members of the Suffolk District, Norfolk District, and Middlesex South Medical Societies, and house officers in the hospitals participating in the program are cordially invited to attend the general sessions as guests of the College. They are requested to register (no fee required) at the headquarters in the Statler in order that they may receive the badge which is necessary for admission to the meetings.

Preliminary program will be published March 21.

SOCIETY MEETINGS

Combined Meetings of the Boston Medical Library, the Suffolk District Medical Society, the Middlesex South District Medical Society and the Norfolk District Medical Society (at Boston Medical Library at 8:15)

March 27, 1929—Meeting in association with Middlesex South District Medical Society. Clinical and Experimental Studies of Obstructing Jaundice and Its Complications. Dr. Waltman Walters, Mayo Clinic.

April 24, 1929—Annual meeting. Speaker, Dr. Walton Martin, New York City. Title to be announced later.

The medical profession is cordially invited to attend all these meetings.

March 14—Staff Meeting of the Massachusetts General Hospital. Complete notice appears on page 513, issue of March 7.

March 15—Harvard Medical Society. Detailed notice page 573.

March 19—South End Neighborhood Medical Club. Detailed notice appears on page 513, issue of March 7.

March 21—New England Hospital for Women and Children. Complete notice appears on page 573.

March 25, 26, 27—American Association for the Study of Goiter. Detailed notice appears on page 213, issue of January 24.

April 8-12—The Annual Session of the American College of Physicians. Complete notice appears on page 578.

May 5-10—First International Congress on Mental Hygiene. Complete notice appears on page 411, issue of February 21.

June 13—International Hospital Congress. Complete notice appears on page 212, issue of January 24.

October 7-19—New York Academy of Medicine. Detailed notice appears on page 468, issue of February 28.

DISTRICT MEDICAL SOCIETIES

Barnstable District Medical Society

Schedule of Meetings: May 2, 1929.

Bristol North District Medical Society

April 18, 1929—Spring meeting.

Essex North District Medical Society

May 1, 1929 (Wednesday)—Annual meeting at Lawrence General Hospital, One Garden Street, Lawrence, at 12:30 P. M. (Telephone 5156.)

May 2, 1929 (Thursday)—Censors meet at Hotel Bartlett, 95 Main Street, Haverhill, at 2 P. M. (Tel. 3430.)

Candidates should present their diplomas one week in advance to the Secretary, J. Forrest Burnham, M.D., 567 Haverhill Street, Lawrence.

Essex South District Medical Society

Wednesday, April 3, 1929—Essex Sanitorium. Clinic at 5 P. M. Supper at 7 P. M. Speaker: Dr. Fred Albee of New York. Subject: Automatic Machinery in Bone Surgery. Discussion from the Floor.

Thursday, May 2, 1929—Censors meet at Salem Hospital, 3:30 P. M. for examination of candidates. Candidates should apply to the Secretary, (Dr. R. E. Stone, Beverly) at least one week prior.

Tuesday, May 14, 1929—Annual Meeting. The Tavern, Gloucester. Speaker: Dr. O. F. Carr, Beverly, Trip around World, Illustrated. Ladies invited. Dancing.

Franklin District Medical Society

Meeting will be held on the second Tuesday of May.

Middlesex East District Medical Society

The following schedule of meetings has been arranged for the coming year:

March—Reading.
May—Melrose.

Subjects and speakers to be arranged by committees in each city or town.

Middlesex North Medical Society

The annual meeting will be held the last Wednesday in April.

Middlesex South District Medical Society

March 27, 1929—Joint meeting with the Suffolk and Norfolk Districts.

April, 1929—Annual meeting. Definite date to be announced later.

Norfolk District Medical Society

Below are the proposed meetings of the Norfolk District Medical Society for the 1928-29 Season. The schedule below will be adhered to as strictly as possible. The carrying out of the proposed plan will, of course, depend upon the acceptances of invitations extended to the speakers. Minor changes may be necessary.

March 29 — Roxbury Masonic Temple. Subject and speakers to be announced.

May—Annual meeting program to be announced.

The Censors of the Society meet May 9, 1929, at the Roxbury Masonic Temple, Warren Street, Roxbury, at 4 P. M., for the examination of candidates.

Plymouth District Medical Society

March meeting at the Moore Hospital, Brockton, Mass., March 21st.

April meeting at the Commercial Club, Brockton, April 18th, at 6 P. M. Annual Oration by Dr. Ralph C. McLeod, Orator; dinner.

Suffolk District Medical Society

See Combined Meetings in previous column.

Worcester District Medical Society

April 10, 1929—Grafton State Hospital. Program to be announced.

May 8, 1929—Annual meeting. Worcester Country Club.

Worcester North District Medical Society

Annual meeting the fourth Tuesday in April.